Letter to the Editor's Desk

Death and the Doc.

Doctor. The dictionary defines us to be the ones who heal. But a more practical and unsugarcoated definition would be that maybe we are mere merchants in the trade of Life and Death. Merchants of Pain. Merchants of Suffering. Merchants in Life. But what of Death?

To be part of this elite group there's a huge price to pay. The price of learning to lose the very habit that singled one out to become a part of this auspice few. The ones who play the game between life and death but the ones that are often blinded to the line between both, mostly left wondering if there's even one.

So what is this huge price? Rather what's that habit that becomes Ekalavya's thumb? Well, its the very essence of what makes up those who choose medicine. The hunger to win in every battle. The aversion to ever lose. The habit of yearning to get the best out of everything. This is a huge price to pay. Why? Because it's the very essence that singled out each medico from the rest. That helped him/her be better than the rest of the 'aspirants' and actually end up as a medico. The Desire to be the Best.

But once he becomes a Doctor, it's this very habit of yearning to win in every battle that he is required to lose. Because, though he has spent a life time trying to be the best in what he does, he is now faced with situations that are apparently out of his control. He can only do so much. Death is something that can be conquered. Atleast, for now. So, when faced with death, there comes a defining moment for every doctor. To learn to take the losses in stride and yet not get too used to it. Because the jolt that each loss leaves on one's ego, that's what pushes him to get better. But taking the losses too personally can in itself drive one insane. So, ultimately, it ends up being about the balance. To learn to have the so called detached attachment.

It is this fine balance of learning to accept you are not entirely in control and yet striving relentlessly to achieve as much control as possible. That I feel is what medicine is all about. To put it more eloquently, as Dr. Paul Kalanithi said, "The cost of ones dedication to succeed is high, and the ineluctable failures bring along nearly unbearable guilt. These burdens are what make medicine holy.

You can't ever reach perfection, but you can believe in an asymptote toward which you are ceaselessly striving."

Death, unfortunately is a unavoidable part of life, atleast for now. Maybe, its time we look up to the next frontier and continue our march in our endless battle to strive against it.

What shall that frontier be? I leave that out to you to ponder.

Dr. B. Skanthavelan,
CRRI,
Govt. Stanley Medical College
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&

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Why do we do basic research? To learn about ourselves.

RESEARCH IS TO SEE WHAT EVERYBODY ELSE HAS SEEN, AND TO THINK WHAT NOBODY ELSE HAS THOUGHT.
INTRODUCTION:

Tuberculosis has been a scourge of mankind from time immemorial. References to Tuberculosis has been found in Vedic literature and Tuberculosis has been identified in Egyptian mummies(1). Robert Koch identified the causative agent of Tuberculosis as Mycobacterium Tuberculosis and announced it to the world in 1882. The treatment of Tuberculosis has come a long way from the Yagnas performed for curing TB in the vedic ages, royal touch and prayers and use of several chemicals as well as sanatorium treatment for Tuberculosis.The discovery of modern medicines due to pioneering work of Waksman who introduced Streptomycin for Tuberculosis treatment, followed by drugs like PAS, Rifampicin, Isoniazid have to some extent successfully brought down the mortality and morbidity of the disease(1). However in reality deaths due to Tuberculosis still occur. Tuberculosis stands among the top 10 causes of death worldwide. Many a promising life has been cut short due to Tuberculosis. The list of victims include great mathematicians like Ramanujam, Doctors like Rene Laennec, Writers like Rosseau, PB Shelley, George Orwell, Prem Chand, statesmen like Jinnah. (1).

The socioeconomic loss to mankind due to Tuberculosis is incalculable. According to the annual status report published by Central TB division, Government of India, India accounts for ¼ th of the Global TB burden. The incidence of TB was 104 Lakhs globally and 28 Lakhs in India in 2015. Mortality due to Tuberculosis was estimated at 14 lakhs annually globally and 4.8 lakhs in India. Incidence of HIV- TB coinfection was 11.7 Lakhs globally and 1.1 Lakhs in India. Mortality due to HIV- TB was 3.9 Lakhs Globally and 37,000 in India. The estimate of cases of MDR- TB stood at 4.8 Lakhs globally and 1.3 Lakhs in India(2). Studies done on mortality due to Tuberculosis found death rates to be higher in capitals with greater income inequality, migration, poverty and HIV-TB coinfection(3).Government hospital of Thoracic medicine, Tambaram Sanatorium is a tertiary care referral centre for advanced and drug resistant forms of Tuberculosis including MDR TB and XDR TB and for HIV- TB coinfection. It is the largest centre for inpatient Tuberculosis care in Tamilnadu, India. This study was conducted to understand the demographics and reasons associated with mortality due to Tuberculosis among the patients at GHTM, Tambaram.

METHODOLOGY:

This study was a retrospective study using case records. The case records and death summary of patients who died over a period of six months between July and December 2016 at Government hospital of Thoracic medicine, Tambaram were screened. The patients who had died due to Tuberculosis were included for the study and deaths due to all other causes were excluded. Standard definitions provided in...
the revised national Tuberculosis control program were used for defining pulmonary TB, extrapulmonary TB, MDR TB, XDR TB. The data of the patients who had died due to Tuberculosis including their demographic profiles, comorbid illnesses like Diabetes, HIV, disease burden were collected and the results were statistically analysed.

RESULTS:
During the period between July 2016 and December 2016, 350 patients had died at GHTM due to several reasons including Myocardial infarction, CVA, malignancies, COPD, respiratory failure, Tuberculosis etc. Of these 202 patients were identified as having died due to Tuberculosis at GHTM, Tambaram Sanatorium.

The results were analysed as depicted below.

### Table 1 - Gender wise distribution of mortality due to Tuberculosis (n = 202)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>176</td>
<td>87%</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>13%</td>
</tr>
</tbody>
</table>

This table shows that the mortality due to Tuberculosis is more in the males (87 %) than the females (13 %).

### Table 2 - Age wise distribution of Mortality

<table>
<thead>
<tr>
<th>Age (In years)</th>
<th>Numbers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 20</td>
<td>5</td>
<td>2.5%</td>
</tr>
<tr>
<td>20 - 40</td>
<td>73</td>
<td>36.1%</td>
</tr>
<tr>
<td>40 - 60</td>
<td>105</td>
<td>51.9%</td>
</tr>
<tr>
<td>&gt;60</td>
<td>19</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

This table shows that most of the deaths (88 %) were in the productive age group of 20 to 60 years. This reflects to socioeconomic loss to the society due to loss of productivity.

### Table 3 - Distribution of deaths among various forms of Tuberculosis.

<table>
<thead>
<tr>
<th>Form of Tuberculosis</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary Tuberculosis</td>
<td>143</td>
<td>71%</td>
</tr>
<tr>
<td>Disseminated Tuberculosis</td>
<td>41</td>
<td>20%</td>
</tr>
<tr>
<td>Extrapulmonary Tuberculosis</td>
<td>18</td>
<td>9%</td>
</tr>
</tbody>
</table>

This table shows that 91% of the mortality were due to Pulmonary and Disseminated forms of TB while 9 % were due to extrapulmonary Tuberculosis.

### Table 4 - Sputum status among the Tuberculosis mortality

<table>
<thead>
<tr>
<th>Sputum status</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sputum positive</td>
<td>152</td>
<td>75%</td>
</tr>
<tr>
<td>Sputum negative</td>
<td>50</td>
<td>25%</td>
</tr>
</tbody>
</table>

This table shows that Sputum positive status was associated with higher mortality.

### Table 5 - Sites of extrapulmonary Tuberculosis among the TB mortality

This table shows that the commonest site of extrapulmonary Tuberculosis associated with mortality is TB meningitis.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleural Effusion</td>
<td>15</td>
<td>7.4%</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>8</td>
<td>3.9%</td>
</tr>
<tr>
<td>Lymph Node</td>
<td>7</td>
<td>3.4%</td>
</tr>
<tr>
<td>Abdomen</td>
<td>3</td>
<td>1.4%</td>
</tr>
<tr>
<td>Bronchopleural fistula</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>Cervical Lymph node + Pleural Effusion</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>Cervical lymph node + Abdominal TB</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>Empyema</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>Skeletal TB</td>
<td>2</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

### Table 6 - Comorbidities observed in TB mortality

This table shows that Diabetes mellitus and HIV coinfection are the leading comorbidities associated with mortality in patients with Tuberculosis.

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Melitus</td>
<td>16</td>
<td>7.9%</td>
</tr>
<tr>
<td>HIV</td>
<td>15</td>
<td>7.4%</td>
</tr>
<tr>
<td>EPILEPSY</td>
<td>8</td>
<td>3.9%</td>
</tr>
<tr>
<td>Chronic Kidney Disease</td>
<td>7</td>
<td>3.4%</td>
</tr>
<tr>
<td>Diabetes Melitus /HIV</td>
<td>3</td>
<td>1.4%</td>
</tr>
<tr>
<td>Diabetes Melitus /Chronic Kidney Disease</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>CORONARY ARTERY DISEASE</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>ANAEMIA</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>HEPATITIS</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>HYPOTHYROIDISM</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>HEMIPLEGIA</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>Diabetes Melitus / EPILEPSY</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>CHOLELITHIASIS</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>HBSAg POSITIVE</td>
<td>1</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

### Table 7 - Categorisation of Tuberculosis mortality based on previous exposure to ATT and drug sensitivity

This table shows that patients never exposed to ATT accounted for 48 % of deaths in Tuberculosis. This is due to several reasons such as delay in diagnosis, delay in initiation of treatment, extent of disease at time of diagnosis and comorbidities.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never exposed to ATT</td>
<td>97</td>
<td>48%</td>
</tr>
<tr>
<td>Previously exposed to ATT</td>
<td>88</td>
<td>44%</td>
</tr>
<tr>
<td>MDR TB</td>
<td>14</td>
<td>7%</td>
</tr>
<tr>
<td>XDR TB</td>
<td>3</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Table 8 - Correlation of duration of Hospitalization & TB...
that the majority of deaths due to Tuberculosis is in the productive age group of 20 to 60 years leading to socioeconomic loss to the community. Also this study reveals that mortality is higher in Pulmonary Tuberculosis and in sputum positive patients which is consistent with earlier studies (5). Our study also reveals that mortality is higher in seriously ill forms of Tuberculosis like meningitis and in association with immunosuppressive illnesses like Diabetes and HIV coinfection.

This study reveals a higher mortality in newly diagnosed patients and within the first week of admission reflecting the late referrals and delayed diagnosis in such patients. The higher mortality among patients with lower saturation and predominant cause of death being respiratory failure reflects the destruction of pulmonary parenchyma due to Tuberculosis. Among HIV patients both Pulmonary and extrapulmonary Tuberculosis equally contribute to the mortality.

This study shows that timely detection of Tuberculosis and initiation of ATT would have prevented 48% of Tuberculosis deaths and elimination of HIV could have prevented 25% of TB deaths. Adequate control of Diabetes mellitus could have prevented another 28% of TB associated deaths. Appropriate measures have to be taken to address these issues.

**CONCLUSIONS:**

This study reiterates the fact that many lives are still lost due to Tuberculosis in the productive age group leading to socioeconomic loss to the community. Hence there is a need for early diagnosis and initiation of treatment and early referrals to cut down to mortality so as to achieve the WHO target of bringing down the mortality due to Tuberculosis by 90% in 2035. Early identification of Tuberculosis, HIV- TB coinfection, control of DM and early referral of cases seems to be the need of the hour.

**REFERENCES:**

INTRODUCTION

Opportunistic infections (OIs), defined as infections that occur frequently and severely in patients with weakened immune system, are the main cause of morbidity and mortality in people living with HIV and AIDS[1]. Current HAART (Highly Active Antiretroviral Therapy) regimens suppress viral replication, provide significant immune reconstitution and has resulted in a substantial and dramatic decline in the AIDS related opportunistic complications and deaths in both children and adults. In an observational study from Thailand, the rate of OIs pre ART was 89.5 infections per 100 person years to 10.5 infections per 100 person years during HAART (1993-2009)[2]. In Brazil, the incidence of OIs among children and adolescents was 18.3 per 100 person-years in the pre- and 2.6 in the post-HAART periods[3]. In a study conducted in our hospital from 2004 to 2007, post HAART Tuberculosis decreased to 2.3 per 100 person – years[4]. Despite this progress, prevention and management of OIs remain a crucial part of management of HIV- AIDS. The relative frequencies of specific OIs may vary in different countries and even in different areas within the same country. Knowledge of the common opportunistic infections in that geographical area will help in implementing the preventive measures against that pathogen[5]. In a study in Karnataka, India- the most common opportunistic infection was Tuberculosis, followed by Candidiasis, cryptococcosis, herpes zoster, cryptococcal meningitis and PCP pneumonia(2014)[5]. In a cross sectional hospital based study in Kenya, the most common OI was bacterial pneumonia followed by tuberculosis[6]. Although, there are many reports on the prevalence of OIs in HIV, only limited data is available with regards to the pattern and risk factors of OIs. This study was undertaken to analyse the pattern and risk factors of OIs in PLHA (Patients Living with HIV- AIDS) on active care in GHTM- COE which is the largest such facility for the management of PLHA and TB-HIV coinfection in South India.

AIM

To study the pattern of opportunistic infections among PLHA on active care and to study the risk factors for development of opportunistic infections among PLHA on active care in GHTM - ART Centre of excellence.

METHODS AND MATERIAL

This study was a retrospective analysis of data from PLHA on active care in GHTM -ART centre.
patients on active care who developed Opportunistic infections during the period from July 2015 to June 2016 conducted at Government hospital of Thoracic medicine, which is a tertiary care centre for management of Respiratory diseases and also Centre of Excellence for ART care with more than 4700 PLHA under active care and regular follow up in our hospital. More than 80 beds are allotted exclusively for the inpatient management of PLHA and HIV-TB coinfection. The data was collected from patients’ registration card, Master line list, OI register and case reports in our centre during the period between July 2015 to July 2016. A total of 4736 PLHA on active care records were screened and patients with documented opportunistic infections during the study period were taken up for study. Available data from OI register including patients symptoms, signs, mode of transmission, the causative agent, chest radiographs, sputum smear examination for AFB, fungus, cultures, blood cultures, stool examination, CBNAAT of sputum and extra-pulmonary samples, CSF analysis and staining which were done depending on patients symptoms and their results were also studied. Data collected were statistically analysed.

RESULTS

Out of the 4736 PLHA patients on active care, 628 patients reported with Opportunistic infections during the study period. Out of the 628, 79 were pre ART and 549 were on ART. The prevalence of OIs in our study was 13.3%. More Opportunistic infections were detected in males (64.8%) compared to females (34.8%).

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>407</td>
<td>64.8 %</td>
</tr>
<tr>
<td>Female</td>
<td>219</td>
<td>34.8 %</td>
</tr>
<tr>
<td>Transgenders</td>
<td>2</td>
<td>3.1 %</td>
</tr>
</tbody>
</table>

Table 1: Sex distribution of PLHA with opportunistic infections

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20</td>
<td>28</td>
<td>4.4%</td>
</tr>
<tr>
<td>21–40</td>
<td>333</td>
<td>53.0%</td>
</tr>
<tr>
<td>40 – 60</td>
<td>260</td>
<td>41.4%</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>7</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Table 2: Age distribution of PLHA with opportunistic infections (n = 628)

Most of the patients (94.4%) in this study were in the productive age group of 21 to 60 years reflecting the socioeconomic loss to the community due to opportunistic infections. The list of Opportunistic infections and their prevalence are presented in TABLE 3.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>OPPORTUNISTIC INFECTION</th>
<th>FREQUENCY</th>
<th>PREVALENCE</th>
<th>CD4-Mean(Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PULMONARY TUBERCULOSIS</td>
<td>287</td>
<td>45.7%</td>
<td>171(3-1401)</td>
</tr>
<tr>
<td>2</td>
<td>RECURRENT RESPIRATORY TRACT INFECTIONS</td>
<td>171</td>
<td>27.4%</td>
<td>323(10-2656)</td>
</tr>
<tr>
<td>3</td>
<td>EXTRA PULMONARY TUBERCULOSIS</td>
<td>84</td>
<td>13.4%</td>
<td>200(7-793)</td>
</tr>
<tr>
<td>4</td>
<td>CANDIDIASIS</td>
<td>72</td>
<td>11.5%</td>
<td>245(24-919)</td>
</tr>
<tr>
<td>5</td>
<td>ACUTE GASTROENTERITIS</td>
<td>13</td>
<td>2.1%</td>
<td>208(26-768)</td>
</tr>
<tr>
<td>6</td>
<td>HERPES ZOSTER</td>
<td>7</td>
<td>1.1%</td>
<td>300(48-618)</td>
</tr>
<tr>
<td>7</td>
<td>POPULAR PRURITIC ERUPTIONS</td>
<td>13</td>
<td>2.1%</td>
<td>344(21-2498)</td>
</tr>
<tr>
<td>8</td>
<td>CRYPTOCCOCCAL MENINGITIS</td>
<td>3</td>
<td>0.5%</td>
<td>82.7(44-109)</td>
</tr>
<tr>
<td>9</td>
<td>PCP</td>
<td>2</td>
<td>0.3%</td>
<td>28.5(14-43)</td>
</tr>
</tbody>
</table>

Table 3: Opportunistic infections and prevalence and CD4 counts

The most common OI was pulmonary tuberculosis (45.7%) followed by recurrent respiratory tract infections (27.4%).

<table>
<thead>
<tr>
<th>S.NO</th>
<th>RISK FACTOR</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CLINICAL STAGE III &amp; IV</td>
<td>457</td>
<td>72.8</td>
</tr>
<tr>
<td>2</td>
<td>BASELINE CD4 &lt; 200</td>
<td>382</td>
<td>60.8</td>
</tr>
<tr>
<td>3</td>
<td>CD4&lt; 200 AT THE TIME OF OI</td>
<td>268</td>
<td>42.7</td>
</tr>
<tr>
<td>4</td>
<td>ILLITERACY</td>
<td>217</td>
<td>34.6</td>
</tr>
<tr>
<td>5</td>
<td>LOWER SOCIOECONOMIC STATUS</td>
<td>187</td>
<td>29.8</td>
</tr>
<tr>
<td>6</td>
<td>HAART NON ADHERENCE</td>
<td>149</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Table 4: Risk factors for opportunistic infections

This table shows that the risk factors for opportunistic infections in PLHA include Clinical staging III and IV, lower baseline CD4 at time of diagnosis, lower CD4 count, illit-
eracy, lower socioeconomic status and non adherence to HAART.

<table>
<thead>
<tr>
<th>Death due to opportunistic infections</th>
<th>93/628</th>
<th>14.8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death due to Tuberculosis</td>
<td>75/628</td>
<td>11.9%</td>
</tr>
</tbody>
</table>

Table 5: Mortality among the PLHA with Opportunistic infections (n = 628)

This table shows that 14.8% of patient died due to opportunistic infection and the major cause of mortality due to opportunistic infections in PLHA is Tuberculosis (75/93; 80%)

<table>
<thead>
<tr>
<th>Number of years since ART initiation</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>343</td>
<td>62.5%</td>
</tr>
<tr>
<td>1 year to 5 years</td>
<td>148</td>
<td>26.9%</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>58</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

Table 6: Year of starting ART among PLHA with opportunistic infections (n = 549)

This table shows that most of the opportunistic infections were observed within the first year of ART initiation and declines as ART is continued.

**DISCUSSION**

This study was done to understand the pattern of opportunistic infections in PLHA and the risk factors for the development of opportunistic infections. Review of available literature reveals a wide variation in the prevalence and pattern of opportunistic infections within different geographical regions and also within the same country. Data from Indian studies on opportunistic infections in PLHA are scarce and highly variable. Understanding the pattern of opportunistic infections is important for preventing morbidity and mortality due to opportunistic infections in PLHA and also for resource allocation in developing countries like India. Our study reveals that over a period of one year about 13.3% of PLHA on active care develop opportunistic infections and that most of these patients are males in the productive age group which reflects the socioeconomic loss to the community. This is comparable to data from NACO10 which shows that 89% of opportunistic infections were in the age group 15–44 years and among males.

The commonest opportunistic infection in PLHA is Tuberculosis (pulmonary plus extrapulmonary) which accounts for 59% of infections. Other significant opportunistic infections were recurrent respiratory tract infections (27.4%) and Candidiasis (11.5%). This is similar to studies done from Tamilnadu and AIIMS8 which reported that 71% of opportunistic infections were due to Tuberculosis followed by Candidiasis. However, there are wide variations in observed opportunistic infections in different geographic regions as studies from various centres like Kenya, Kolkata reveal.

It is observed that among mortality due to opportunistic infections in PLHA, Tuberculosis contributes to 80% of the mortality. Recent changes in the program including fast tracking of presumptive TB suspects, 4s symptom screening and introduction of CBNAAT will bring down the burden and transmission of the disease. This study attempted to identify risk factors for opportunistic infections in PLHA and found WHO clinical stages III and IV, baseline CD4 <200 at time of diagnosis, CD4<200 at time of opportunistic infections, illiteracy, lower socioeconomic status and HAART non adherence as contributing factors for opportunistic infections. It was observed in this study that most opportunistic infections occurred within the first year of ART and decreased in subsequent years which reflects that early initiation of ART may prevent the occurrence of opportunistic infections. Recently Government of India has launched the ‘test and treat’ initiative for ART. Henceforth all PLHA will receive ART which will help bring down the morbidity and mortality due to opportunistic infections in PLHA.

**CONCLUSION**

Although the prevalence and incidence of OIs in patients with HIV- AIDS have dramatically decreased with HAART, there are several milestones that we are yet to reach in the management of Opportunistic infections. The need of the hour is to reduce morbidity and mortality due to Opportunistic infections in PLHA by early initiation of ART, preventive strategy like cotrimoxazole and INH prophylaxis therapy, early diagnosis and treatment of the Opportunistic infections and early initiation and adherence to ART.

**REFERENCES:**

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INTRODUCTION

Health care providers (HCP) are prone to serious occupational threats following exposure to blood borne pathogens. Post-exposure prophylaxis (PEP) is the use of short-term anti retroviral therapy (ART) to reduce the risk of acquisition of HIV infection following exposure. In early 21st century, the incidence of HIV increased rapidly and there aroused the need for prophylaxis as a measure to maintain health and prevent the spread of disease. Post-exposure prophylaxis (PEP) is the use of short-term anti retroviral therapy (ART) to reduce the risk of acquisition of HIV infection following exposure. Current guidelines recommend a 28-day course of ART within 72 hours of occupational exposure. Guidelines for post exposure prophylaxis dates back to 1990, when the US Center for Disease Control and Prevention (CDC) considered such recommendations. The prophylaxis for non occupational exposure was first stated in 1998 and later updated in 2005 by CDC. Post exposure prophylaxis for children is considered in cases of community acquired needle stick injuries, pre mastication and sexual assaults. Subsequently the World Health Organization (WHO) first considered PEP in 2007 and focused on occupational exposures. The recently published WHO guidelines recommend that a PEP regimen be administered as soon as possible within the 72-hour window period after a HIV-related exposure and a 3-drug regimen is preferred.

SUBJECTS AND METHODS

AIM

This study is concerned with occupational exposure risk to HIV in our hospital, the most common groups affected, their knowledge about universal precautions/ the ways to minimize such exposure and the usage of PEP.

MATERIALS & METHODS

A retrospective analysis of occupational exposures among HCPs in a tertiary care center from Jan 2013 to Jun 2015 was done. The Inclusion criteria included Health Care Providers with needle prick / mucosal splash of less than 72 hrs. Exclusion criteria was exposure > 72 hrs. Exposure code (EC) and source code (SC) were individualised as per NACO guidelines. Baseline HIV, Rapid Plasma Reagin(RPR), HBsAg, Anti HCV, CBC, LFT and RFT had been also done.

RESULTS AND OBSERVATION

In our study, the total numbers of persons with occupational exposure were 101, of which PEP was warranted in 80. The common age distribution of study population was 18 – 25 years (Figure 1). In our study females
(58%) were slightly higher than males (42%). The percentage of exposure among various category were as follows (Figure 2) – doctors (32%), of them mostly were interns, lab technicians [LT](35%), male nursing assistants (13%), nurses (12%) and female nursing assistants (9%). Various first aid methods taken following exposure were noted in (Table 1). The percentage of individuals who practised universal precautions before handling potentially infectious material was only 10.89%. The reporting time intervals were <2hrs in 41.30% of cases, 2 - 6 hrs in 8.09%, 6-24 hrs in 36.80% and 24-72 hrs in 13.81% cases (Figure 3). The type of exposure was mostly needle prick (i.e) EC 2 (94%) followed by mucosal splash (6%) (Figure 4).The source code was known in 55.46% of cases and unknown in 44.54%. Of the known cases HIV status was positive in 23.76% of cases (Figure 5). PEP was recommended for 80 of 101 health care providers and was given basic regimen (Zidovudine and Lamivudine) (57 cases) intially and TEL (Tenofovir, Efavirenz and Lamivudine) regimen (23 cases) in later part of the study, as NACO guidelines was revised to three drug regimen. Of the 80 persons given PEP, 82.5% completed the course whereas 17.5% (14 cases) defaulted (11 cases in basic regimen and 3 in TEL regimen). The reason for default was mainly side effects of the drugs like myalgia and gastritis with basic regimen and dizziness with newer regimen. One individual had adverse drug reaction (skin rash) to efavirenz who was later put on second line drugs (protease inhibitor). Later the individual defaulted because of its gastrointestinal side effects. Utilisation of PEP was higher with TEL regimen (Figure 6). Only 48% of those who took PEP had come for follow-up.

**DISCUSSION**

According to UNAIDS gap report 2016, 2.1 million people are living with HIV in India with a prevalence of 0.3% and there are 86,000 new infections every year. Overall, India’s HIV epidemic is slowing down, with a 19% decline in new HIV infections (130,000 in 2013), and a 38% decline in AIDS-related deaths between 2005 and 2013. (UNAIDS (2014) ). All this effects is attributed to effective AIDS control programme in India. PEP is also one such programme initiated, but its efficacy has been questioned largely which needs further study. Unfortunately, there are no prospective randomized controlled trials of PEP efficacy due to the ethics of withholding a potentially efficacious treatment and the difficulty in recruiting the high number of participants that would be required for such a study(11). Most animal models have shown the benefit of PEP in terms of preventing HIV acquisition(12). However, com-

**Figure 1 : Distribution of age group**

**Figure 2 - Category of HCPs involved**

**Figure 3 : Reporting time after exposure**

**Figure 4 - Type of exposure**

**Figure 5 - Source code**

**Figure 6a: ZL regimen**

**Figure 6b: TEL regimen**

**Figure 6: utilisation of PEP**
Comparisons between these studies are difficult as they use different retroviruses, inocula volumes, and modes of transmission. The scientific rationale for post-exposure prophylaxis (PEP) using antiretroviral agents is supported by the finding that the virus is detectable in regional lymph nodes within 2 days of mucosal HIV infection and that systemic dissemination occurs after 4–11 days, allowing a window of opportunity for suppression of viral replication and possibly prevention of established infection(13). Though the efficacy of PEP in humans has not been examined in a large randomized controlled trial, a retrospective case–control study of HIV seroconversion in health care workers after percutaneous exposure showed that a 4-week course of zidovudine reduced the risk of HIV infection by 81% (95% confidence interval (CI), 48–94%) (14). Moreover Antepartum and postpartum administration of zidovudine to mother and newborn, respectively, results in substantial reduction in perinatal transmission of HIV infection(15). A study conducted by Henderson et al on exposure risk was similar to literature (0.3%) (16). Assessing the need for PEP mandates the need of exposed HIV status to be negative. Prior to PEP first aid managements plays a significant role in prevention of infection. There is specific protocol for it in respect to skin and mucous membrane as given below.

### FIRST AID MEASURES

<table>
<thead>
<tr>
<th>FIRST AID MEASURES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washed with soap and water</td>
<td>58.42</td>
</tr>
<tr>
<td>Antiseptic/spirit application</td>
<td>22.77</td>
</tr>
<tr>
<td>Squeezed the affected area</td>
<td>10.89</td>
</tr>
<tr>
<td>No steps taken</td>
<td>7.92</td>
</tr>
</tbody>
</table>

*Table 1: The percentage of first aid measures taken*

If the skin is broken after a needle-stick or sharp instrument, immediately wash the wound and surrounding skin with water and soap. Neither scrub the area nor use antiseptics nor skin washes (bleach, chlorine, alcohol, betadine) or strong detergents. After splash to the eye, irritate the exposed eye immediately with water or normal saline. Sit in a chair, tilt head back and ask a colleague to gently pour water or normal saline over the eye. If wearing contact lens, leave them in place while irrigating, as they form a barrier over the eye and will help protect it. Once the eye is cleaned, contact lens can be removed and cleaned in the normal manner. This will make them safe to wear again. In cases of splash into the oral cavity, spit the fluid out immediately, rinse the mouth thoroughly using water or saline and spit again. Repeat this process four to six times. (Table 2)

<table>
<thead>
<tr>
<th>Do</th>
<th>Do Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove gloves, if appropriate</td>
<td>Do not panic</td>
</tr>
<tr>
<td>Wash the exposed site thoroughly with running water</td>
<td>Do not put the pricked finger in mouth</td>
</tr>
<tr>
<td>Irrigate with water or saline if eyes or mouth have been exposed</td>
<td>Do not squeeze the wound to bleed it</td>
</tr>
<tr>
<td>Wash the skin with soap and water</td>
<td>Do not use bleach, chlorine, alcohol, betadine, iodine or other antiseptics/detergents on the wound</td>
</tr>
</tbody>
</table>

*Table 2: Do’S And Don’t’S In PEP*

Eligibility for PEP is decided on the exposure code of the individual and the HIV status of the source. To date, PEP guidelines have consisted of stepwise algorithms involving complex risk assessments and differing interventions (oxford). In our study, a considerable amount of persons eligible for PEP were students. This is similar to that of studies done by Marnejon et al (17). The student groups included DMLT (35%), doctors (31%) followed by nurses (12%). This observation is quite different from that of Shevkani M et al where nurses were mostly involved. This can be attributed to that in our hospital most of the investigation works were done by intern and lab technicians. This proves that oft-forgotten segment of the HCPs who are at high risk for occupational exposure, yet frequently has little training regarding the exposures that qualify for PEP and the availability of PEP interventions, are students and recent graduates in internships(3). In our study follow up of exposed persons, both eligible and not eligible was very less (<48%) similar to Shevkani M et al. There was no case of seroconversion in the study populations who were followed up for 6 months. Given that the losses after PEP administration are significant, Strategies such as short message service, phone reminders and treatment supporters could be used to maintain contact with exposed individuals beyond the 28-day ARV period to enhance appropriate follow-up testing. Moreover a
CONCLUSION

Occupational exposures require urgent medical evaluation. Ideally PEP must be started within 2 hours of exposure and so the first dose of PEP should be offered while evaluation is underway. PEP is a comprehensive management which includes first aid, counselling, risk assessment, relevant laboratory investigations, based on the informed consent of the source and exposed person. A 1-stop model should be the norm for PEP service provision, to avoid losing exposed individuals in the shuffle from one department to another so that defaulters and lost to follow up can be minimized. Similarly educating the Residents, who are the back bone of medical institution about universal precautions during their orientation programme and frequent training classes can minimize exposure in a paramount. Other measures like changing surgical techniques to avoid ‘exposure prone’ procedures, use of needle less systems and other safe devices should be encouraged. Lastly, proper counselling before initiation of PEP is important for proper adherence and good outcome.

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1. Washing hands immediately if contaminated with body fluids
2. Wearing gloves when contamination with body substances
3. Protective eyewear and mask should be worn when splashing with body substance is anticipated
4. All HCW should take precautions to prevent injuries during procedures and when cleaning or during disposal of needles and other sharp instruments
5. Needle should not be recapped
6. Needles should not be purposely bent or broken by hand, nor removed from the disposable syringe or manipulated by hand
7. Double gloving
8. After use, disposable syringes and needles, scalpel blades and other sharp items should be placed in a puncture-resistant container
9. HCW who have exudative lesions or dermatitis should refrain from direct patient care and from handling equipments
10. Clean and disinfect blood/body substances’ spills with appropriate agents, Adhere to the disinfection and sterilization standards
11. Regard all waste soiled blood/body substance as contaminated and dispose off according to relevant standards and finally
12. Vaccinate all clinical and laboratory workers against hepatitis B

Table 3: Steps for Universal precautions (21)


ORIGINAL ARTICLE - BIOCHEMISTRY

PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM IN PATIENTS WITH CHRONIC KIDNEY DISEASE

J Siva Somana(1), R Mahalakshmi(2), M Vijayalakshmi(3)

Abstract

Context Subclinical hypothyroidism, an independent predictor of cardiovascular morbidity and mortality, is 4 -10% prevalent in the general population. A higher prevalence of clinical and subclinical primary hypothyroidism exists in CKD patients leading to ESRD earlier. Aims To study the prevalence of Subclinical Hypothyroidism and its correlation with various stages of chronic kidney disease.

Settings and Design: This Analytical study was conducted in patients coming to the OPD in Govt. Stanley Medical College Hospital. Methods and Material: 50 CKD patients in the predialysis phase and 50 healthy controls, who attend the regular OPD in Govt. Stanley Medical College Hospital were selected for our study. Staging of CKD done with the eGFR calculated using MDRD formula and the prevalence of subclinical hypothyroidism with TSH levels <10mIU/mL were studied in these patients and compared with the control population. Statistical analysis used Chi-square test, Regression analysis and Pearson’s correlation coefficient applied with the help of Microsoft Excel Software for studying the prevalence of Subclinical Hypothyroidism and its correlation with various stages of chronic kidney disease Results Subclinical hypothyroidism is more prevalent in CKD patients (40%) when compared with the general population (6%). Subclinical hypothyroidism was found to be 8%, 10%, 20% and 12% in the stages I, II, III, IV and V of CKD patients and it gradually increases as the stage of the CKD advances. As the eGFR falls, TSH starts increasing and it may be due to alteration in the hypothalamo-pituitary axis, TSH glycosylation and diurnal rhythm. It may also be due to altered metabolism of thyroid hormones and decreased peripheral conversion of T4 to T3. The exact mechanisms linking CKD and hypothyroidism are still unclear. Conclusions From the results of our study, we conclude that the prevalence of Subclinical hypothyroidism is high among all the stages of CKD patients. Need for treatment depends on the patient’s clinical scenario and decision of the clinician based on the presentation. Many more clinical trials are needed to prove the need for thyroxine replacement.

Key-words Chronic kidney disease, Pre-Dialysis phase ESRD, Subclinical hypothyroidism, MDRD formula, TSH, free T4 levels.

INTRODUCTION

Chronic kidney disease is the 12th cause of death and the 17th cause of disability globally. India has witnessed a sharp rise in the incidence of chronic diseases and mortality during the past few decades. Poor recognition of risk factors and early stages of CKD contributes to significant morbidity and mortality.(1) The data about incidence or prevalence of ESRF not treated with renal replacement therapy is unknown for lesser degrees of chronic renal failure. Many patients are undiagnosed or not yet referred. About 30% of new patients meet a nephrologist for the first time less than 3 months before dialysis.(2,3) The estimated prevalence rates of chronic kidney disease and ESRD in India are 800 and 200 per million inhabitants, respectively.4 In South India, the main causes of CKD are diabetic nephropathy (29.6%), chronic interstitial nephritis (20.4%), chronic glomerulonephritis(17.4%) and hypertensive nephropathy(11%).4,5 Subclinical hypothyroidism, a concept recently developed is found to be 4 to 10% prevalent in the general population and the prevalence increases with age, increased iodine intake and also in females more than 45yrs of age.(6) Patients with overt or subclinical hypothyroidism are also found to have reduction in renal function.(6,9)

In the Third National Health and Nutrition Examination Survey participants, CKD was found to be associated with a higher prevalence of clinical and subclinical primary hypothyroidism.5 Coronary heart disease accompanies both primary overt and subclinical hypothyroidism because of abnormalities in lipid profile and endothelial dysfunction. Hence SCH need to be screened to prevent morbidity and mortality.(10,11) Awareness regarding thyroid abnormalities in those in the early stages of CKD and also in the Predialysis phase are still lacking.(12,13)

AIM & OBJECTIVES

To estimate TSH and Free T4 levels in Chronic kidney disease patients. To calculate the eGFR using MDRD Formula and classify the patients with CKD into 5 stages. To study the prevalence of Subclinical Hypothyroidism in patients with various stages of chronic kidney disease.

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MATERIALS AND METHODS
50 apparently normal healthy persons aged more than 20 years and 50 patients aged more than 20 years diagnosed to have CKD with illness more than 6 months in the Pre-Dialysis phase were enrolled in the study conducted in the Nephrology clinic in Govt. Stanley Hospital, Chennai-1. Patients with known thyroid disorders, on treatment with drugs like estrogen, steroids, sulphonyl ureas, β-blockers, Patients exposed to contrast dyes were excluded from the study. Pregnant patients and children were also excluded from the study.

After getting clearance from the Institutional ethical Committee, Study population was selected and examined after informed consent. Fasting morning blood sample was collected under strict aseptic precautions in red topped clot-activator venipuncture tubes. Blood was allowed to clot. After centrifugation at 2000-2500 rpm for 15 minutes, Serum samples were separated immediately from the cells and stored at -20ºC in deep freezer. Renal and thyroid function tests were done in the serum. eGFR calculated using MDRD formula with serum creatinine done using enzymatic kit from Agappe and patients were classified into 5 stages according to American Kidney Foundation as follows:

<table>
<thead>
<tr>
<th>Stages</th>
<th>GFR ml/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>&gt; 90</td>
</tr>
<tr>
<td>I</td>
<td>≥ 90</td>
</tr>
<tr>
<td>II</td>
<td>60-89</td>
</tr>
<tr>
<td>III</td>
<td>30-59</td>
</tr>
<tr>
<td>IV</td>
<td>15-29</td>
</tr>
<tr>
<td>V</td>
<td>&lt; 15</td>
</tr>
</tbody>
</table>

a - With risk factors for CKD.

b - With demonstrated kidney damage.

RESULTS
Among the CKD patients, subclinical hypothyroidism, hypothyroidism, subclinical hyperthyroidism and hyperthyroidism have their prevalence rates as 40%, 20%, 4% and 2% respectively. 34% of CKD patients have normal thyroid function. (Graph.1). Prevalence of Thyroid disorders are 71.4%, 62.5%, 56% and 80% in the stages II, III, IV and V of CKD respectively. Patients with Subclinical hypothyroidism increase as the stage of CKD advances. (Table.1)

Based on Chi-square test,
Calculated $\chi^2$ value = 39.06;
Tabulated $\chi^2$ value at $p < 0.05$ =3.841
Calculated $\chi^2$ value > tabulated $\chi^2$ value and hence there is statistically significant difference in the prevalence of thyroid abnormalities among CKD patients when compared with the control population.

Positive predictive value: TP/(TP+FP) = 33/36 = 91.7%
Negative predictive value: TN/(TN+FN) = 47/64 = 73.4%
The positive predictive and negative predictive values were 91.75 and 73.46 respectively. The positive predictive value suggests an increased chance of subclinical hypothyroidism association with chronic kidney disease than the control population (Table.2). Pearson’s correlation coefficient of different analytes among CKD patients shows: TSH varies directly with urea (positive correlation) and inversely with eGFR (negative correlation). Free T4 varies directly with eGFR (positive correlation) and inversely with Urea & creatinine (negative correlation) (Table.3). TSH values have a negative correlation with eGFR as indicated by the downward slope of linear regression analysis and the r value is equal to 0.056. (Graph.2) TSH values have a negative correlation with creatinine indicated by the downward slope of the linear regression value and the r value is equal to 0.1. (Graph.3) TSH values have negative correlation with urea values as indicated by the downward slope of the linear regression analysis and the r value is equal to 0.2 (Graph.4).

DISCUSSION
The case-control study with 50 healthy control subjects and 50 patients CKD demonstrated the increased prevalence of subclinical hypothyroidism among CKD patients in the predialysis phase. GFR was estimated using MDRD formula and the CKD patients were classified into 6 stages using the National Kidney Foundation. K/DOQI Clinical Practice Guidelines for chronic kidney disease. Cases were...
<table>
<thead>
<tr>
<th>Stage</th>
<th>Normal</th>
<th>Subclinical hypothyroidism</th>
<th>Hypothyroidism</th>
<th>Hyperthyroidism</th>
<th>Subclinical Hyperthyroidism</th>
<th>Thyroid abnormalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5 out of 7 (71.4%)</td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5 out of 8 (62.5%)</td>
</tr>
<tr>
<td>IV</td>
<td>11</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>14 out of 25 (56%)</td>
</tr>
<tr>
<td>V</td>
<td>2</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8 out of 10 (80%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th>Controls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid abnormalities (SCH, Hypothyroidism, etc.)</td>
<td>33</td>
<td>3(SCH-6%)</td>
<td>36</td>
</tr>
<tr>
<td>Normal thyroid function</td>
<td>17</td>
<td>47</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2: Chi-square test for thyroid abnormalities among cases and controls

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Analytes</th>
<th>Pearson's correlation coefficient</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>TSH Vs eGFR</td>
<td>-0.054</td>
<td>Negative correlation</td>
</tr>
<tr>
<td>2.</td>
<td>TSH Vs Urea</td>
<td>0.0211</td>
<td>Positive correlation</td>
</tr>
<tr>
<td>3.</td>
<td>Free T&lt;sub&gt;4&lt;/sub&gt; Vs eGFR</td>
<td>0.282</td>
<td>Positive correlation</td>
</tr>
<tr>
<td>4.</td>
<td>Free T&lt;sub&gt;4&lt;/sub&gt; Vs Urea</td>
<td>-0.075</td>
<td>Negative correlation</td>
</tr>
<tr>
<td>5.</td>
<td>Free T&lt;sub&gt;4&lt;/sub&gt; Vs creatinine</td>
<td>-0.195</td>
<td>Negative correlation</td>
</tr>
</tbody>
</table>

Table 3: Pearson’s Correlation between different analytes in CKD patients

Graph 1: Prevalence of Thyroid disorders in Chronic Kidney Disease

Graph 2: Regression analysis between TSH levels and eGFR in CKD patients

Graph 3: Regression analysis between TSH levels and creatinine in CKD patients

Graph 4: Regression analysis between TSH levels and urea in CKD patients
50%, 20%, 16% & 15% in stages IV, V, III and II respectively. No cases in stage 0 and 1, suggesting a delay in seeking medical attention and thereby very late presentation of the patients to the OPD. The duration of illness was less than two years in most patients (24 out of 50). There was an increase in the TSH values with fall in eGFR and free T4 levels sustains in the normal range despite low eGFR in the CKD patients. Kapstein et al demonstrated a low to normal free T4 levels in their patients. Also they explained that low total T4 levels are due to altered protein binding in CKD patients and hence not much variation observed in free T4 levels. We found the prevalence rates of subclinical hypothyroidism, hypothyroidism, subclinical hyperthyroidism and hyperthyroidism in CKD patients as 40%, 20%, 4% and 2% respectively. 34% of patients have normal thyroid profile. Ghanshyam et al showed increased prevalence of SCH in CKD patients in contrast to healthy controls in their studies. The prevalence of Subclinical hypothyroidism was found to be 8%, 10%, 20% and 12% in the stages II, III, IV and V of CKD patients. It gradually increases as the stage of CKD advances. Lo et al showed in their studies, 10 to 20% of patients with stage 2 to 5 chronic kidney disease (CKD) are hypothyroid and the subclinical cases among them are >50%. Giovanni et al showed subclinical hypothyroidism was about 20% prevalent in earlier stages of CKD independent of other biochemical parameters. In our study, the prevalence of thyroid abnormalities were found to be more in stages IV and V suggesting an increased prevalence as the stage of CKD advances. Most of them are with hypothyroidism either subclinical or overt on testing. Kapstein et al showed prolonged Wolff-Chaikoff effect, blunted response to thyroid stimulation tests and abnormal rhythm of TRH secretion as the reasons for reduced serum T4 levels among CKD patients. Based on chi-square test, there is a statistically significant difference in the prevalence of subclinical hypothyroidism among CKD patients when compared with the general population. Positive predictive value of SCH in CKD is found to be 91.7%. Prevalence of subclinical hypothyroidism was about 6% in the control population. SCH has been found to be 8% prevalent in the general population. On Comparison of cases and controls using Student’s unpaired “t” test, a statistically significant difference in their TSH, eGFR, urea and creatinine values except free T4 values exists suggesting that TSH, eGFR, Urea and Creatinine levels are higher than the controls except the free T4 values which are mostly comparable between cases and controls. Student’s unpaired ‘t’ test between quantitative variables among cases suggests that TSH, eGFR, Urea and Creatinine levels are dependent on each other but the free T4 values are independent of these variables among CKD patients. Pearson’s Correlation coefficient of TSH, free T4, Urea, Creatinine and eGFR values was studied among CKD patients. There is a negative correlation between TSH and eGFR values suggesting that there was an inverse relationship between estimated GFR and TSH levels throughout the TSH range. Giovanni et al showed that high TSH levels were more closely related to the low eGFR values in their studies. There is a positive correlation between TSH and Urea suggesting that TSH increases as the urea level increases with advanced stage of CKD. Ramirez et al showed that uremia causes alteration in hypothalamo-pituitary axis and thereby high urea levels cause an elevation in the TSH levels. There is a positive correlation between free T4 and eGFR values among CKD patients suggesting that fall in free T4 occurs as the eGFR falls. In contrast, Giovanni et al showed that there is no much variation in free T4 levels among different stages of CKD.[10] Anegative correlation exists between free T4 and Urea among CKD patients. Zoccali et al found no reduction of free T4 levels when compared with low T3 levels among ESRD patients as the defect is mainly due to inhibition of peripheral conversion of T4 to T3 by inflammatory mediators. Shin et al showed that there is attenuation of fall in GFR on thyroid replacement therapy and also TRT reduces the progression rate to ESRD. High total and LDL cholesterol levels have been demonstrated in SCH. According to some studies, treatment of SCH with eltroxin improves the cardiac contractility and lowers the total cholesterol and LDL levels than the pretreatment levels. No beneficial effects have been demonstrated in some other studies. Also the treatment in CKD to bring euthyroidism to preserve renal function has not yet been extensively studied. In overt hypothyroidism, there is decreased Renal Blood Flow and GFR, high creatinine levels and hypernatremia leading to worsening of kidney function. Makino et al showed that thyroid replacement therapy improves the renal function in these patients and more so in patients with ischemic renal failure. No such definite pathology has been found in subclinical hypothyroidism by Villabona et al. Fatourechi et al showed that patients with SCH and TSH levels more than 10mIU/ml and also patients with TPO antibodies and TSH levels less than10mIU/ml were benefitted on treatment. In this study, we found an increased prevalence of subclinical primary hypothyroidism in persons with reduced estimated GFR independent of other parameters compared with the general population. The incidence of subclinical hypothyroidism was found to increase with progressively lower
eGFR values. But the exact mechanism linking CKD and hypothyroidism still remains unclear.

CONCLUSIONS

From the results of our study, we conclude that Prevalence of Subclinical hypothyroidism is high among all the stages of CKD patients. Incidence of thyroid abnormalities increases as the stage of CKD advances with fall in GFR. But the need for treatment depends on the patient’s clinical scenario and decision of the clinician based on the presentation. Many more clinical trials are needed to prove the need for thyroxine replacement.

REFERENCES:

20. Shin DH et al. Thyroid hormone replacement therapy attenuates the decline of renal function in chronic kidney disease patients with subclinical hypothyroidism :PMID:23281965 Thyroid. 2013 Jan 2.
Regression of Fibroadenoma In Response To Centchroman Therapy- A Randomized Control Trial

Balamurugan C(1), Vignesh M(2), Princess Beulah D (3), Sabarimalai P(4)

Abstract

Context Fibroadenoma is a common cause of breast lump in young girls. Nearly 10–15 % of lesions regress spontaneously over the period of 6 to 60 months. Aim The aim of study was to investigate the role of Centchroman in regression of fibroadenoma in comparison to natural observation in persons who is willing for observation instead of excisional biopsy (enucleation) between 18 -30 yrs old. Settings and Design The study was carried out at the outpatient clinic of Department of General Surgery, Govt. Stanley medical College from November 2014 to April 2015. Study design Randomized control trial Material 80 Patients Methods and Material Patients aged ≤30 years with fibroadenoma were included. Patients with fibroadenoma equal to or larger than 3 cm and with polycystic ovarian disease were excluded. Patients were randomized in two groups. Patients in active therapy arm were prescribed Centchroman 30 mg on alternate days for 12 weeks, and another group was observed without any intervention (control group). Patients were followed at weeks 4, 8, 12, and 24. USG Breast done at 0 days, 12 and 24 weeks for both groups to assess volume regression. Statistical analysis used The collected data was analysed with SPSS 16.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples in independent groups (Study group & Control group) Unpaired sample t-test was used. For the repeated measures (Volume zero day ,12th week & 24th week ) the Repeated measures of ANOVA with adjustment for multiple comparisons to control the type I error, the Bonferroni test was used. To find the significance in categorical data Chi-Square test was used. Results At the end of 12 weeks follow-up, 38 (95%) patients showed decrease in size in study as compared to 11(27%) in control group. At the end of 24 weeks follow-up, 15 (37.5%) patients showed complete disappearance compared to 5 (12.5%) patients in control group. Conclusions Centchroman therapy in Fibroadenoma treatment showed statistically significant regression of volume in Patients more than 30 yrs old and young patients (<30 yrs) with suspicious histology, recurrence, family h/o carcinoma breast, anxiousness and no response to conservative management. Key-words: Fibroadenoma (FA), Centchroman, Polycystic ovarian disease

Key Messages Centchroman therapy – a upcoming alternative instead of enucleation for fibroadenoma

INTRODUCTION

Fibroadenoma (FA) is the most common tumour of breast in young females (<30 yrs). It is a benign condition. FA is responsible for 15% palpable breast lump. It clinically presents as painless breast lump in reproductive age groups. FA is very rare as new lump over the age of 40-45 yrs. Most of the FA cases are self diagnosed and consults surgeon in fear of breast cancer. For the patients with small FA (<3 cm) below 30 yrs of age without suspicious cytology, simple observation with reassurance is enough because 15 to 30 % FA regress completely by simple observation over 1 to 6 yrs follow-up.

SUBJECTS AND METHODS

The purpose of this study is to find the Regression of fibroadenoma in response to centchroman therapy (ormeloxifene) in persons who is willing for observation instead of excisional biopsy (enucleation) between 18 -30 yrs old.

STUDY DESIGN

Randomized control trial

Material

80 Patients

Study and follow-up period

6 months

INCLUSION CRITERIA

Diagnosed as FA under triple assessment, Age 18 to 30 year, Fibroadenoma of sonographic size 3 cm or <3 cm, Patient not willing for excision (fear of scar), Willing for observation with signed informed Consent

EXCLUSION CRITERIA

Past history or family history of ca breast, Polycystic ovarian disease ( PCOD), Liver disease, renal failure, Lactation, Pregnant and who desire to be pregnant, Complex fibroadenoma

Patients attending general surgery OPD with complaints of breast lump between 18 to 30 yrs of age subjected for detailed clinical history, clinical examination, ultrasonogram (USG) of both breasts and fine needle aspiration (FNAC)/ core needle biopsy
Patients who diagnosed as fibroadenoma (FA) and willing for simple observation with reassurance at least for 6 months were included in this study after getting informed consent. Willing patients after randomization included in study group and control group. Patients in study group given Centchroman 30mg orally on alternative days and in control group patients were only observed with simple assurance. Study group patients reviewed after 1 week to check tolerance and later follow-up done at 4, 8, 12, and 24 weeks. USG both breasts done at 0 days, 12 and 24 weeks for both groups to assess regression.

**DISCUSSION WITH RESULTS**

Fibroadenoma (FA) is the most common tumor of females less than 30 yrs old & 20% of the patients shows bilateral and 20% shows multiple FA. After verifying various studies about conservative management of mastalgia and benign breast conditions like fibroadenoma and fibroadenosis, we inferred that only 15% of fibroadenoma will regress spontaneously over 1 – 6 yrs observation. Hence, we decided to do this study by assessing regression of fibroadenoma with centchroman therapy instead of simple observation.

According to the study “Regression of Fibroadenoma with Centchroman: a RCT” done by Praksah laxmichand and Tejwani et al in AIIMS, Department of General Surgery, New delhi between Nov 2004 to Nov 2007 with 6 months follow-up, 31.8% fibroadenomas in study group who had 30 mg centchroman OD for 90 days daily showed complete disappearance as compared to only 7.69% in control group. 52.17% fibroadenomas decreased in size in study group as compared to control group. In our study, patients had centchroman 30 mg OD on alternative days. Among 80 patients, 40 patients were included in study group and 40 patients in control group. Among these, 8 patients (10%) showed bilateral FA presentation. At the end of 12 weeks follow-up, 38 patients (95%) showed decrease in size in study group as compared to 11 patients (27%) in control group.

Table 1: 12th Week Volume change

<table>
<thead>
<tr>
<th>SIZE</th>
<th>STUDY-GROUP</th>
<th>CONTROL GROUP</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECREASE</td>
<td>38</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td>INCREASE</td>
<td>2</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>NO CHANGE</td>
<td>0</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>

Figure 1 - 12th week Volume change

At the end of 24 weeks follow-up, 15 patients (37.5%) showed complete disappearance as compared to 5 patients (12.5%) in control group. Among these, 22 patients (55%) showed decrease in size as compared to 6 patients (15%) in control group. 21 patients (30%) in control group showed increase in size compared to study group where only 2 patients (5%) showed increase in size.

Figure 2 - 24th week Volume change
### Table-2: 24th Week Volume change

<table>
<thead>
<tr>
<th>Size</th>
<th>Study Group</th>
<th>Control Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Disappearance</td>
<td>15</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Decrease</td>
<td>22</td>
<td>6</td>
<td>37</td>
</tr>
<tr>
<td>Increase</td>
<td>2</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>No Change</td>
<td>1</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>

**VOLUME OF FIBROADENOMA:**

Size of FA was calculated by doing breast ultrasound using 7.5 – MHZ linear probe on “Siemens versa” ultrasound scanner[2].

Volume in cubic centimetre is calculated by using the following formula

\[
\text{SIZE} = a \times b \times c \times 0.52
\]

where:

- \(a\): largest dimension
- \(b\): dimension at right angle to \(a\)
- \(c\): \(a+b/2\)

**STATISTICAL ANALYSIS**

The collected data was analysed with SPSS 16.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples in Independent groups (Study group & Control group) Unpaired sample t-test was used. For the repeated measures (Volume zero day,12th week & 24th week ) the Repeated measures of ANOVA with adjustment for multiple comparisons to control the type I error, the Bonferroni test was used. To find the significance in categorical data Chi-Square test was used. In all the above statistical tools the probability value .05 is considered as significant level.

**LIMITATIONS OF THE STUDY**

This study presents data based on 6 months follow-up only. Long term results of centchroman on recurrent and further decrease in size requires further studies in future.

**CONCLUSIONS**

1. Centchroman therapy in FA treatment showed statistically significant regression of volume.
2. Long term results beyond 6 months needs further study.
3. It is useful in patient who is willing for observation instead of Enucleation of FA.
4. Patients more than 30 yrs old and young patients (<30 yrs) with suspicious histology, recurrence, family h/o carcinoma breast, anxiousness and those who had no response to conservative management are the ideal candidates for active management of excisional biopsy (enucleation of FA).

**ACKNOWLEDGEMENT**

Sincere gratitude to the following people for the outcome of this original article

The Dean of our institution
HOD, Professor & Faculties of General Surgery
Department of Pathology, Radiology, Microbiology, Biochemistry for investigations & evaluation

Last but not least, our patient without whom this article is not possible.

**REFERENCES**


AN EXPERIENCE WITH BLUNT INJURY ABDOMEN - RETROSPECTIVE CASE SERIES STUDY

Chandrasekar(1), Vivek Nagappa(2), Sivakumar(3), Jim JebaKumar (4)

Abstract

Aim To study the etiology of blunt injury abdomen in congested and industrial locality. To study the different organs injured when a person sustains blunt trauma to the abdomen. To study the management protocol in emergency patient coming with blunt trauma abdomen. Methods and Material The study was carried out from May 2015 to March 2017. A complete history and clinical examination of the patients were carried out. Then various investigations such as Complete Blood Count (CBC), X-Rays, ultrasound of the abdomen and CT scan of the abdomen were done in order to arrive at the diagnosis. Once diagnosed patients were either treated conservatively or surgically. Type of study A retrospective descriptive study. Results Totally 120 patients with blunt trauma were studied. Blunt trauma was found to be more common in 3rd decade of life (46%) and more in males. Spleen (33%) and liver (28%) were most commonly injured. Road traffic accident was seen in 44% and assault are seen in 40%. Conclusions Blunt trauma is increasing due to increase in vehicles and violence mainly in industrial and congested areas. Early diagnosis, prompt initial resuscitation and timely management will reduce the mortality.

Key-words blunt trauma abdomen, road traffic, assault, CT abdomen, Early diagnosis, resuscitation.

INTRODUCTION

Now a days blunt injury abdomen is increasing. It has become one of the leading cause of morbidity and mortality. Especially trauma due to road traffic accident and assault is becoming major health issues in developing countries like India. Trauma is the second largest cause of disease accounting for 16% of global burden. The World Health Organization estimates that, by 2020, trauma will be the first or second leading cause of years of productive life lost for the entire world population. Among trauma road traffic and assault are more common compare to other mode of trauma causing blunt injury abdomen. The care of the trauma patient is demanding and requires speed and efficiency. Evaluating patients who have sustained blunt abdominal trauma remains one of the most challenging and resource-intensive aspects of acute trauma care. Trauma is the leading cause of death and disability in developing countries and the most common cause of death under 45 years of age. Worldwide injury is the 7th leading cause of mortality and abdomen injury being 3rd in the list. Around 25% of abdominal injury in civilian requires interventions. 85% of abdominal traumas are of blunt injury type. The spleen and liver are the most commonly injured organs as a result of blunt trauma. Patients brought to the emergency ward with trauma require immediate attention and evaluation. Blunt injury to the abdomen can also occur as a result of fall from height, assault with blunt objects, sports injuries and bomb blasts. Accurate diagnosis and avoidance of needleless surgery are an important goal of evaluation. Among the signs, Rob’s dictum (1947) was useful, “The absence of peristaltic sounds, confirmed and reconfirmed is a positive indication for laparotomy, but the presence of peristaltic sound is only a valuable guide toward and not a positive indication for conservative management.” In 1940, Gray Turner gave valuable advice with regards to undertaking laparotomy for closed abdominal injuries as follows: “The patient will not die from a very big incision, but may very likely succumb if some important injury is overlooked.” Clinical examination alone can’t correctly diagnose blunt injury abdomen as patient may present with altered mental status due to trauma shock or head injury or in case of poly trauma. Focus assessment with sonography in trauma (FAST) and CT abdomen is very useful to arrive at diagnosis. Systemic approach and prioritized approach is needed. Few of the patient will present with hypovolemic shock and will be persistent as there will be continuous loss of blood. Emergency surgical interventions will reduce mortality. Damage control laparotomy is lifesaving. On the other spectrum, non-operative management is becoming new trend in management of hemodynamically stable patients. Pre-hospital transportation, initial assessment, thorough resuscitative measures and correct diagnosis are of utmost importance in trauma management.

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SUBJECTS AND METHODS

A retrospective descriptive study of 120 cases of blunt abdominal trauma patients presenting to Govt Stanley Medical College Hospital from May 2015 to March 2017 was done. After initial resuscitation, detailed clinical history, physical examination, laboratory tests and x-rays, ultrasonography was done to arrive at the diagnosis. CT scan was done in most of the cases. Variables like age, sex, cause of blunt abdominal trauma, time of presentation of patient, signs and symptoms, operative findings, various procedures employed, associated extra abdominal injuries, post-operative complications and mortality were noted. Patients included in the study were those presenting with blunt injury abdomen due to road traffic accident, assault, fall from height and other mode of blunt injury like accidental animal kicks over abdomen or got injured due to fall of some heavy object, had rolled down the stairs or stumbled over some blunt object Patients excluded from this study were those presenting with acute abdomen due to stab injury, cut injury, hollow viscus perforation, bowel gangrene due to thrombosis, penetrating injury and other pathological condition leading to acute abdomen. Patients coming with trauma were resuscitated and subjected to clinical examination which include pulse, blood pressure, respiratory rate and clinical abdominal examination. After initial resuscitation, appropriate investigations, such as the hemoglobin value, and ultrasound of the abdomen were repeated as and when necessary. The decision for operative or non-operative management depended on the outcome of the clinical examination, hemodynamic stability of the patient and the results of the investigations done. Indications for laparotomy in a patient with blunt injury abdomen include the following:

- Signs of peritonitis.
- Uncontrolled hemorrhage or persisting shock.
- Clinical deterioration during observation like falling pulse rate and blood pressure.
- Findings such as haemoperitoneum on FAST or CT.

Patients selected for conservative management, are subjected to serial clinical examination and strict bed rest.

RESULTS

Demographic profile

We included 120 blunt trauma patients; 80% were male and 20% were females. The predominant age group was 21-30 years constituting 46% of patient. [Table 1]. Majority of patients are male, may be due to more males being involved in violence compared to females.

<table>
<thead>
<tr>
<th>Sex/ Age range</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>96</td>
<td>80%</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>20%</td>
</tr>
<tr>
<td>Age Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11-20</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>21-30</td>
<td>24</td>
<td>46</td>
</tr>
<tr>
<td>31-40</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>41-50</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>51-60</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>61-70</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Table.1 - Demographic profile

Epidemiological features

In our study from table 2, Road traffic accident constituted 44% and assault constituted 40%. Both RTA and assault were almost equal in number. This was due to increase in number of vehicles and violence and located in congested and industrial locality

<table>
<thead>
<tr>
<th>Causes</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road traffic accident</td>
<td>53</td>
<td>44%</td>
</tr>
<tr>
<td>Assault</td>
<td>48</td>
<td>40%</td>
</tr>
<tr>
<td>Fall from height</td>
<td>13</td>
<td>11%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>6</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table.2 - Cause of Blunt Trauma Abdomen

Time of Presentation

In our study, from table 3, Majority of patients (90%) presented before 24hrs of trauma. Twelve patients presented after 24hrs.

<table>
<thead>
<tr>
<th>Time of Presentation</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-8hrs</td>
<td>24</td>
<td>20%</td>
</tr>
<tr>
<td>9-16hrs</td>
<td>46</td>
<td>38%</td>
</tr>
<tr>
<td>17-24hrs</td>
<td>38</td>
<td>32%</td>
</tr>
<tr>
<td>25-48hrs</td>
<td>8</td>
<td>7%</td>
</tr>
<tr>
<td>&gt;48hrs</td>
<td>4</td>
<td>3%</td>
</tr>
</tbody>
</table>

Table.3 - Time of Presentation
**Clinical features**

In our study, from table 4, Majority of the patients presented with pain abdomen. Among physical signs, 43 presented with hypotension and 35 of them with guarding/rigidity. In case of spleen injury, patient may not present with pain abdomen instead with hypotension in spite of initial resuscitation.

<table>
<thead>
<tr>
<th>Clinical Presentation</th>
<th>No. of blunt trauma cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>110</td>
</tr>
<tr>
<td>Guarding/Rigidity</td>
<td>35</td>
</tr>
<tr>
<td>Distension</td>
<td>14</td>
</tr>
<tr>
<td>Vomiting</td>
<td>10</td>
</tr>
<tr>
<td>Hypotension</td>
<td>50</td>
</tr>
<tr>
<td>Haematuria</td>
<td>10</td>
</tr>
<tr>
<td>Shock</td>
<td>24</td>
</tr>
<tr>
<td>Retention of urine</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4 - Clinical Features

**Abdominal injuries**

X-ray abdomen, ultrasound abdomen and CT abdomen and pelvis were done and multiple injuries were revealed. Spleen injury was 37%, liver 24% and small bowel 16%. The presence of fluid without solid organ injury is a significant marker of mesenteric or bowel injury. Studies done by Davis et al and Cox et al also show the spleen as the most common organ injured in blunt injury abdomen. However, in the study done by Davis et al the percentage of splenic injury was 25%, whereas in the study done by Cox et al the percentage of splenic injury was 46%.

<table>
<thead>
<tr>
<th>Organ Involved</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spleen</td>
<td>29</td>
<td>33%</td>
</tr>
<tr>
<td>Liver</td>
<td>24</td>
<td>28%</td>
</tr>
<tr>
<td>Small Intestine</td>
<td>12</td>
<td>14%</td>
</tr>
<tr>
<td>Mesenteric Tear</td>
<td>4</td>
<td>4%</td>
</tr>
<tr>
<td>Retroperitoneal Hematoma</td>
<td>8</td>
<td>10%</td>
</tr>
<tr>
<td>Bladder</td>
<td>10</td>
<td>11%</td>
</tr>
</tbody>
</table>

Table 5 - Distribution of cases in Blunt Trauma Abdomen

**Various procedures performed**

From the table 6, in our study, splenectomy (32%) was the most common procedure done. Primary bowel anastomosis and closure of perforation in 16%. Bladder repair 13%. From the Table 7 it is seen in our study that, some of the patients with blunt injury abdomen could be treated conservatively. This was mainly due to the low grade of injury to the particular organ and the fact that the patient was haemodynamically stable.

<table>
<thead>
<tr>
<th>Operative Procedure</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Splenectomy</td>
<td>25</td>
<td>32%</td>
</tr>
<tr>
<td>Splenorraphy</td>
<td>4</td>
<td>5%</td>
</tr>
<tr>
<td>Resection Anastomosis</td>
<td>9</td>
<td>11%</td>
</tr>
<tr>
<td>Primary Bowel Repair</td>
<td>4</td>
<td>5%</td>
</tr>
<tr>
<td>Bladder Repair</td>
<td>10</td>
<td>13%</td>
</tr>
<tr>
<td>Gel Foam and Pack</td>
<td>24</td>
<td>30%</td>
</tr>
<tr>
<td>Stoma</td>
<td>3</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 6 - Various Procedures Performed

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative</td>
<td>41</td>
<td>34%</td>
</tr>
<tr>
<td>Operative</td>
<td>79</td>
<td>66%</td>
</tr>
</tbody>
</table>

Table 7 - Treatment

**DISCUSSION**

Management of blunt abdominal trauma is an arduous task even to the best of traumatologists. Injuries ranging from single organ to mutilating multi organ trauma may be produced by blunt abdominal trauma. Abdominal trauma continues to account for a large number of trauma-related injuries and death. Blunt abdominal trauma is on the rise because of easy availability and use of motor vehicles, increase in crime and violence. Unrecognized abdominal injury is a frequent cause of preventable death after trauma[6]. Out of 120 cases in our study 46% of patients were in 21-30 years of age group. This goes in accord with studies of Davis et al[7] and Lowe et al[8]. The male preponderance in our study reflects that the greater mobility of males for automobiles or recreational activities caused contribute to a higher exposure to the risk of traffic injuries and involving in assault. Commonest intra-abdominal injury was splenic injury in 37% followed by liver injury. Commonest hollow organ injury was small bowel perforation. Most common bowel injured was ileum. These results were consistent with other studies of Davis[7] and Morton et al[9]. Motor vehicle accidents and urban violence are the leading cause of blunt abdominal trauma. Road traffic accident is preventable[10]. In our study, 66% patients underwent laparotomy. Laparotomy was carried out to locate and repair injured viscera/organ, inspect abdominal cavity for other injuries, clean peritoneal cavity and control contamination and also to give the patient a definite treatment. The spleen is the most commonly injured organ. Splenic injuries may be life-threatening even in the patient who appears hemodynamically stable with missed intra-abdominal injuries a leading cause of preventable death in
trauma patients. The rapidity of initial diagnosis of splenic injuries is, therefore, crucial. Unfortunately, splenic injuries may be subtle and present without abdominal pain or tenderness even in the alert non-intoxicated patient.

CONCLUSION

Blunt abdomen trauma is becoming more and more common mainly in this congested and industrial area. It is more seen in 3rd decade of life and in males compare with females. When laparotomy is decided, then a thorough examination of the abdominal organs must be done. In our study the spleen was found to be the most common organ injured in blunt injury abdomen. Early admission, in transit resuscitation, diagnosis and prompt and appropriate treatment can save lives.

REFERENCES


ACKNOWLEDGEMENT

The authors would like to express their gratitude towards department of general surgery, Govt. Stanley Medical College Hospital for providing contact support.
INORIGINAL ARTICLE - CARDIOTHORACIC SURGERY

INTRAPLEURAL INSTALLATION OF Tranexamic acid for the control of postoperative bleeding following thoracic surgical procedures for chronic inflammatory pleural/pulmonary diseases - A Randomised prospective Clinical study

Amaravathi Sivaraman(1), Arasu Abinayavallaban(2), Srinivasan Thiruneelakandan(3)

Abstract

Context Postoperative bleeding following open thoracic surgical procedures for chronic inflammatory pleural/pulmonary diseases (CIPPD) is adding considerable morbidity and mortality by increasing the need for more blood transfusion and its related complications. Aim We aim to study the effectiveness of intra-pleural installation of Tranexamic acid (TA) to control postoperative bleeding in patients undergoing various open thoracic surgical procedures for CIPPD. Settings and Design: 5 years and 6 months from October 2011 to March 2017 at a single surgical unit in the Department of Cardiovascular & Thoracic Surgery, Rajiv Gandhi Government General Hospital & Madras Medical College, Chennai. Study design Randomized prospective double-blind controlled study. Methods and Material: 240 consecutive adult patients with CIPPD scheduled for various types of open thoracic surgical procedures ranging from Decortication to pneumonectomy were assigned randomly to receive either intrapleural instillation of TA (1gm in 100 ml normal saline) [Group 1] or 100 ml of normal saline alone [Group 2] on closure of thoracotomy wound after adequate haemostasis and aerostasis through intercostal drainage (ICD) tube. A minimum contact time of 1 hour was kept to allow for local effect and systemic absorption of drug. All patients were maintained in lateral decubitus position postoperatively with wound site facing upwards during this contact period of one hour before allowing for tube drainage. In patients with air leak, a second ICD tube was kept open for air drainage while the other ICD tube in dependent position was temporarily blocked for one hour to allow for contact time. Complete blood counts, bleeding and clotting times were done pre and postoperatively. Postoperative blood loss and blood products requirements were noted. The results were compared and analysed between the two groups. Statistical analysis used To find the significant difference between the bivariate samples in Independent groups the Unpaired sample t-test was used. To find the significance in categorical data Chi-Square test and Fisher’s exact test were used. In all the above statistical tools the probability value of 0.05 is considered as significant level. Results Significant postoperative bleeding was noted in group 2 compared with group 1. The mean total blood loss was 211 ± 147 ml in group 1 and 460 ± 235 ml in group 2. Blood transfusion requirements were lower in group 1 (22.14%) when compared to group 2 (54.28%). No thrombotic or transfusion related complications were noted in both the groups. Conclusions Our prospective observational study results showed Intra-pleural instillation of TA was beneficial and effective in reducing the postoperative bleeding and blood products requirements in patients undergoing open thoracic surgical procedures for CIPPD. Moreover the use of TA didn’t increase thrombotic complications. Key-words Chronic inflammatory pleural/pulmonary disease (CIPPD)– Post operative bleeding – Intrapleural Tranexamic acid (TA) Key Messages: Intra-pleural instillation of TA was beneficial and effective in reducing the postoperative bleeding following open thoracic surgical procedures for CIPPD.

INTRODUCTION

Postoperative bleeding is adding considerable morbidity and mortality following open thoracic surgical procedures for chronic inflammatory pleural/pulmonary diseases (CIPPD), thereby increasing the need for more blood transfusion and its related complications. Many studies have proven the effectiveness of tranexamic acid in decreasing postoperative bleeding and transfusions in primary coronary artery bypass surgeries 1,2 previously. Through this study, we now aimed to study its topical effectiveness, compare the standards and analyse the outcome of various open thoracic surgical procedures and set standards for ourselves.

SUBJECTS AND METHODS

240 consecutive adult patients with CIPPD scheduled for various types of open thoracic surgical procedures ranging from Decortication to pneumonectomy, between the period from October 2011 to March 2017 (5 years and 6 months), constituted the sample for this Randomized prospective double-blind controlled study.

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2 Post graduate, Department of Cardiothoracic surgery, Madras medical college & Rajiv Gandhi gov't. general hospital, Chennai, Affiliated to The Tamilnadu Dr.MGR Medical University
3 Post graduate, Department of general surgery, Govt. Stanley Medical College & hospital, Chennai, Affiliated to The Tamilnadu Dr MGR Medical University
**Inclusion criteria**

All patients undergoing open thoracic surgical procedures for CIPPD.

**Exclusion criteria**

Patients with existing bleeding diathesis, Known hypersensitivity to tranexemic acid, History of colour vision defects, seizure disorder and renal impairment.

Adult patients with CIPPD like bronchiectasis, fungal aspergilloma, lung abscess, empyema thorax & fibrothorax scheduled for various types of open thoracic surgical procedures ranging from Decortication to pneumonectomy. They were assigned randomly to receive either intrapleural instillation of TA (1gm in 100 ml normal saline) [Group 1] or 100 ml of normal saline alone [Group 2] on closure of thoracotomy wound after adequate haemostasis and aero-stasis through intercostal drainage (ICD) tube. Tranexemic acid / normal saline was instilled in post op ICU as soon as after shifting the patient from operation theatre (OT) to prevent ICD malposition. Both the patients and the operating surgeon were unaware of the groups. A minimum contact time of 1 hour was kept to allow for local effect and systemic absorption of drug. All patients were maintained in lateral decubitus position postoperatively with wound site facing upwards during this contact period of one hour before allowing for tube drainage. In patients with air leak, a second ICD tube was kept open for air drainage while the other ICD tube in dependent position was temporarily blocked for contact time of one hour. ICD was removed depending upon nature & quantity of discharge. When the drainage per day was less than 50 ml of bloody discharge & less than 100 ml of sero-sanguineous discharge, ICD was removed. In case of air leak, ICD was removed once the air leak subsided. Both shifting blood loss in the ICD (from OT to ICU) & ICD blood loss at ICU after TA/ normal saline instillation were noted. Non ICD blood loss from wound site and soakage of dressing was also noted. Complete blood counts, bleeding and clotting times were done pre and postoperatively. Postoperative blood loss and blood products requirements were noted. Similarly complications like re-infection, clot formation & reduced lung compliance were noted and the results were compared and analysed between the two groups.

**DISCUSSION & RESULTS**

**TRANEXEMIC ACID**

Tranexemic acid is a synthetic derivative of lysine that inhibits fibrinolysis by blocking the lysine binding sites on plasminogen. It is an Anti-fibrinolytic that inhibits both Plasminogen activation and Plasmin activity thus preventing clot breakdown rather than promoting new clot formation. It has an onset of action within 5-15 minutes, with maximum duration of about 3 hours. Half life is about 2-11 hrs with biological half-life in the joint fluid is about 3 hours. The plasma protein binding of tranexamic acid is about 3% at therapeutic plasma levels and seems to be fully accounted for by its binding to plasminogen (does not bind serum albumin). Only a small fraction of the drug is metabolized (less than 5%). Urinary excretion is the main route of elimination via glomerular filtration. Usual dose is 1gm in 100 ml of normal saline given over 10 minutes (loading dose) – Followed by 1gm in 100 ml of normal saline over 8 hrs intravenously 3. In our study, we used 1 gm in 100 ml of normal saline topically.

Indications: Haemorrhage, Hereditary angioedema, Chronic heavy menstrual bleeding

Side effects: Ocular – colour vision change, vision loss, Seizures – probably related to neuronal GABA inhibition, Renal Impairment

Contra indications: Acquired defective colour vision, Sub Arachnoid haemorrhage, Active intravascular clotting including Deep vein thrombosis & Pulmonary embolism, Hypersensitivity to tranexamic acid

In our study, majority of patients falls within age group between 20 to 40 years of age which constitutes about 136 cases out of 240 (56.6%) and male gender predominates nearly 75% compared to females. This data coincides with other chronic inflammatory pulmonary or pleural pathology like bronchiectasis, aspergilloma, lung abscess and empyema following cigarette smoking and tuberculosis sequelae commonly occurring in Indian males predominately between 20-40 years of age.

<table>
<thead>
<tr>
<th>AGE GROUP</th>
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<td>120</td>
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</table>

Table 1 - Comparison of age
Our Study results show among CIPPD, bronchiectasis seems to be foremost indication for various open surgical procedures which accounts for 91 cases out of 240 (37.9%). Fungal aspergilloma constitutes the second predominant indication of about 54 cases (22.5%) which usually follows tuberculosis sequelae, commonly occurs in upper lobe of lung. For lung abscess & empyema thorax, initially drainage and evacuation tried following which decortication done in those failed cases. Fibrothorax constitutes the least in our study (7.5%) for which decortication done.

<table>
<thead>
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Table 2 - Sex Distribution

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Table 3 - Surgical Indications

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<td>DRAINAGE &amp; EVACUATION</td>
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<td>23</td>
<td>55</td>
<td>22.9</td>
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<td>24</td>
<td>49</td>
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<td>DECORTICATION</td>
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<tr>
<td></td>
<td>120</td>
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<td>240</td>
<td>100</td>
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</table>

Table 4 - Open Thoracic Procedures

Among the procedures lobectomy constitutes the common procedure (32.5%) in both the groups done for bronchiectasis, lung abscess and fungal aspergilloma commonly. Drainage & evacuation procedures rank the next (22.9%). Pneumonectomy done for less number of cases (11.3%) compared to lobectomy, usually done only as a last resort. In our study, by analyzing the difference between ICD blood loss among the two groups, the mean ICD blood loss in group I who received tranexamic acid is 211 ml which shows statistically significant difference compared to group II who received normal saline (460 ml). p value was < 0.01. This data coincides with the international study. A meta analysis & systematic review including 7 trials with 622 patients conducted by abirashmi et al 4 showed reduced blood loss of about 220 ml in tranexamic acid group compared to placebo. Study results showing non ICD blood loss which included leak from wound site, soaking from dressing site between the two study groups also was statistically significant. Non ICD blood loss from group I is 147 ml compared to group II which is 235 ml. p value was < 0.01.

Figure 1 - ICD & Non-ICD Blood Loss

We also noticed that in our study, day of removal of ICD in group I is approximately 3 days compared to 8 days in group II. ICD removal depends upon nature & amount of discharge. Duration of ICU stay also reduced in group I (average one day) thereby reducing morbidity of patients compared to 5 days in group II. Both the values are statistically significant. P value < 0.01.

Figure 2 - Day of ICD Removal & Duration of ICU Stay

In our study, usage of blood & blood products transfusion like whole blood, packed cell, fresh frozen plasma are very much reduced in group I patients (approximately 2 units) compared to group II (approximately 5 units) which is statistically significant 5. P value <0.01. Thus, tranexamic acid which is cost effective, applied topically shows good
outcome. Though, tranexamic acid usage in higher doses produced side effects like seizures, renal impairment & prothrombotic complications like DVT & pulmonary embolism in some studies, low dose of 1 gm in 100 ml saline in our study does not produce any adverse effects.

Study results shows complications like re-infection was notably reduced in group I patients (3%) compared to group II (17%) thereby reducing ICU stay which is statistically significant 6.7. p value < 0.01. Other complications like clot formation & poor lung compliance also less in group I patients.

**STATISTICAL ANALYSIS**

To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples in Independent groups the Unpaired sample t-test was used. To find the significance in categorical data Chi-Square test and Fisher’s exact test was used. In all the above statistical tests the probability value .05 is considered as significant level.

**CONCLUSIONS**

Our prospective randomised double blind control study results shows that intra-pleural instillation of TA was beneficial and effective in reducing the postoperative bleeding and blood products requirements which is statistically significant. Topical use of TA considerably reduced the hospital stay & post operative complications to a considerable extent thereby reducing morbidity & mortality in patients undergoing open thoracic surgical procedures for CIPPD. Usage of intrapleural topical TA did not increase thrombotic complications as well.

**REFERENCES**


**ACKNOWLEDGEMENT**

Sincere gratitude to the Dean of our institution, Department of Thoracic medicine and above all our patients without whom this article is not possible. No conflict of interest.
INTRODUCTION

Amputation is the surgical removal of whole or part of the limb or extremity. There are many reasons for amputation such as accidents, diabetes mellitus, PVD, infections, tumors and congenital anomalies. Health conditions that affect the blood vessels such as peripheral vascular disease, peripheral arterial disease and diabetes mellitus are the leading causes of amputation. Most of these were lower extremity amputations, which are performed 11 times more frequently than upper extremity amputations (1). Lower extremity amputations are classified into minor and major amputation. Major amputations are trans tibial and trans femoral amputations. Minor amputations are toe disarticulation, ray amputation, mid tarsal and tarso metatarsal amputations. Among diabetes related complications, ulceration of foot is the most common one, affecting about 15% of diabetic patients in their lifetime (2). This can be due to day to day social and cultural practices. Among those barefoot walking, inadequate facilities for diabetes care, poor hygiene, illiteracy, and poor socioeconomic conditions are important which lead to ulceration. Foot ulceration is absolutely preventable and by simple interventions, one can reduce amputations up to 80%. Adequate glycemic control, good hemoglobin status, adequate control of blood pressure and prompt lipid levels are well established crucial elements in the reduction of risk related to complications of diabetes.

The second leading cause of amputation is trauma. Traumatic amputation is most common in the young adult age (3). The prevalence of trauma related major amputation continues to decrease over time. This reduction in traumatic amputation is attributable to implementation of new safety regulations, development of safer farm and industrial machinery, improved safety in work conditions and medical advancement in techniques for salvaging traumatized limbs. The loss of limb has profound effect on economic, psychological and social factors for an individual and their family. In general, amputation is done when all the options for limb salvage failed. Major limb amputation carries high peri operative mortality and morbidity. Hence this study is done to find out the prevalence of lower extremity amputation among patients who came to the hospital for rehabilitation and the most common etiologies leading to lower limb amputations, so that appropriate preventive measures can be applied to reduce the incidence.

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MATERIALS AND METHODS

Cross sectional study was conducted by collecting the inpatient data with sample population size, n=514 for a period of 3 years from 2014 to 2016, who were admitted for first prosthesis fitting with various etiology at Government Institute of Rehabilitation Medicine, Madras Medical College, Chennai. We have excluded the patients, who have come for second or more prosthesis fitting of lower limb amputation and also upper limb amputations. Parameters like age, sex, etiology, level(trans tibial and trans femoral) of amputation were assessed in this study. Simple statistical analysis was done among the study patients assessing the prevalence, sex, etiology and the age group affected.

RESULTS

The total number of study subjects are n-514, among which there are 421 males and 93 females with lower limb amputations, with the ratio of 4:1(Table: 1).

<table>
<thead>
<tr>
<th>GENDER</th>
<th>FREQUENCY</th>
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<tr>
<td>FEMALE</td>
<td>93</td>
<td>18.1</td>
</tr>
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</table>

Table.1 - Sex distribution

Based on the analysis, primarily affected age group is 41 to 60 years and second highest impacted age is 21-40 years in the sample population. Accident is the common etiology in the age group of 21 – 40 years. Common etiology in the age group > 40 years to <80 years is Diabetes Mellitus. Based on the analysis for age group between 0 – 20 years, congenital anomaly and bone tumors are common(Table 2) In our study, there were 355 transtibial, 137 transfemoral amputations and 22 amputations(Figure 1) including toe amputations, tarso-meta tarsal disarticulations and ankle disarticulations. In patients with diabetes(Figure 2) who are included in this study, there are 158 males and 61 females. Among the female patients(n=61), 53 patients(86.9%) underwent transtibial amputation and 8 patients(13.1%) underwent transfemoral amputation. Among the male patients(n=158), 132 patients(83.5%) underwent transtibial and 26 pa-

<table>
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<tr>
<th>AGE GROUP</th>
<th>CONGENITAL</th>
<th>ACCIDENT</th>
<th>DIABETES</th>
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<td>19</td>
<td>47</td>
<td>22</td>
<td>514</td>
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</table>

Table.2 - Age wise distribution on etiology for lower limb amputations

DISCUSSION

The number of major amputations increased in diabetic population than trauma, which is similar with pre-
previous studies (4-6).

Diabetic foot syndrome is the most common indication for lower limb amputation (7). The risk of amputation is raised up to 15 fold in diabetic population (8). The main factors responsible are Neuropathy, Biomechanical abnormalities, Reduced blood circulation, Super added Infection, Poor glycemic control. In our study, there were predominantly male gender (n=158) than female (n=61) in diabetic population, a finding which is consistent with previous studies. But there is no statistically (p=0.541) significant difference between male and female population of lower extremity amputation. The mechanism of lower extremity amputation in male gender is not known, but could be related to delayed wound healing, associated smoking habits, increased stress on the feet caused by increased height and body weight (9).

Females have more efficient wound healing due to properties of estrogen receptor beta (10,11), where as androgens are implicated to reduced wound healing (12,13). This correlates with male gender has a increased risk of lower extremity amputation. There is a high probability that patients with diabetes in our study of younger age would have type 1 diabetes mellitus, which explains the younger age groups of patients had lower extremity amputation usually higher level due to longer duration of diabetes (14). Hence good glycemic control and proper foot care management on periodic basis should be undertaken. Proper foot ware, avoidance of bare foot walking and regular foot examination by podiatrist will reduce the amputation rates. This study showed second most common etiology is accidents, which predominantly affects male population. The main causative factors are human errors, environmental defects and defective implementation of rules and regulations.

CONCLUSION

Diabetes related major amputations rate increases with age and are more prevalent in male. Increased cost factor in maintaining proper foot care in an emerging economy like India remains challenging in preventing foot ulcer. Hence awareness program is necessary to identify the risk factors for foot ulcers in early stage which would further reduce the rates of major amputations. Second most common etiology is accidents. For this group, road and train safety measures with industrial training for safety measures should be focused and they should be educated on hazards of not following the prescribed safety measures.

Limitations of the Study

1) Study period is of short duration.
2) Sample size is small.
3) Sampling is done from single institute.
4) Not able to assess the associated comorbidities.
5) Did not know about exact duration of the diabetes and treatment follow up.
6) Done from secondary data.

Future Scope of Study

1) Study period may be extended.
2) Sample size can be increased.
3) State wise data and nation wise data to be collected.
4) More parameters can be included for statistical analysis.
5) Advanced statistical techniques can be used to define model and then find correlation between different parameters. So that an empirical model can be arrived and used for future studies.

REFERENCES


FOR MOST DIAGNOSES ALL THAT IS NEEDED IS AN OUNCE OF KNOWLEDGE, AN OUNCE OF INTELLIGENCE, AND A POUND OF THOROUGHNESS
INTRODUCTION

Liver, a vital organ in our body has various functions like synthesis, storage, secretion, etc. They secrete many biologically active substances and markers including enzymes. Serum bilirubin, enzymes such as Aspartate aminotransferase (AST), Alanine aminotransferases (ALT), and Gamma glutamate aminotransferase (GGT) are taken as liver function test parameters. These intracellular enzymes are normally found in blood in minimal amount which represents the normal cellular turn over, while elevated levels are associated with liver cell injury. During any intra abdominal surgery particularly laparotomy, the chances of liver injury is more due to anaesthetic drugs, intra-operative infections or even due to mechanical pressure exerted by the liver retractor during surgery. This injury may lead to release of intra cellular liver enzymes elevation post-operatively\(^1\). Herewith we present a case in which the mechanical pressure given by liver retractor during emergency laparotomy led to liver cell injury and acute transient elevation of transaminases called Retraction transaminitis\(^2\).

CASE HISTORY

A 23 yrs old primigravida, with 4 months amenorrhoea was admitted in Institute of Obstetrics and Gynaecology, Egmore for acute abdominal pain. Her presenting complaint was sudden onset of abdominal pain in the left side for 2 days which gradually aggravated with mild fever and blood in urine. No history of injury or any trauma in recent days. Menstrual and marital histories were normal and she has conceived naturally.

On General Examination

Pulse rate: 98/min, B.P: 100/60 mmHg. Respiratory rate: 15/min, Temperature: 99° F, No pedal edema.

Abdominal examination

Over distended abdomen with a mass in the supra pubic and left Iliac fossa was noted. The uterus was of 16-18 weeks size and shifted to Right Iliac fossa.

UltraSonogram

Huge twisted left ovarian cyst complicating the pregnancy (19 weeks) was noted.

Routine investigations such as Complete blood count & Biochemical investigations were performed and were found to be in normal range except anaemia (Hb: 5.5 g/dL) for which blood transfusion was done.

<table>
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<td>Urea</td>
<td>18 mg/dL (8 - 23 mg/dL)</td>
</tr>
<tr>
<td>Serum Creatinine</td>
<td>1.0 mg/dL (0.6 - 1.2 mg/dL)</td>
</tr>
<tr>
<td>Serum Total Bilirubin</td>
<td>0.8 mg/dL (0.8 - 1.2 mg/dL)</td>
</tr>
<tr>
<td>Serum AST (SGOT)</td>
<td>40 IU/L (&lt;31 IU/L)</td>
</tr>
<tr>
<td>Serum ALT (SGPT)</td>
<td>15 IU/L (&lt;34 IU/L)</td>
</tr>
</tbody>
</table>

TABLE: 1 Pre-operative (on the day of admission) biochemical investigations
Emergency Laprotomy - Left ovariectomy was done under general anaesthesia. Immediate post-operative period was uneventful and the patient was apparently healthy without any symptoms. Biochemical investigations were performed as routine in which it was observed that serum bilirubin and transaminases were elevated while the Renal function and haematological tests were within the normal reference limit. Hence, serial measurements of liver function tests were performed and the results are given in Table 2. Fig: 1 Shows the trend of serum transaminases (AST & ALT) during the post operative days in this case.

Post operative LFT values showed that Total Bilirubin, AST & ALT raised transiently from 1st day to 3rd day which then decreased and reached the base line by 12th day.

<table>
<thead>
<tr>
<th>Postoperative days</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Total Bilirubin (mg/dL)</td>
<td>1.0</td>
<td>3.2</td>
<td>3.5</td>
<td>3.0</td>
<td>2.4</td>
<td>1.6</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>SGOT/AST (IU/L)</td>
<td>72</td>
<td>1299</td>
<td>1469</td>
<td>1260</td>
<td>107</td>
<td>54</td>
<td>51</td>
<td>29</td>
</tr>
<tr>
<td>SGPT/ALT (IU/L)</td>
<td>59</td>
<td>629</td>
<td>540</td>
<td>365</td>
<td>162</td>
<td>74</td>
<td>53</td>
<td>24</td>
</tr>
</tbody>
</table>

**TABLE-2: Biochemical investigations during postoperative days.**

**DISCUSSION**

From the results obtained in the postoperative days for this patient, we infer that liver cell injury has occurred during the laparotomy procedure causing release of intracellular enzymes.

Causes of Injury to Liver during Laprotomy:
1. Anaesthetic drug (Eg: Halothane, Sevoflurane)
2. Infection
3. Mechanical injury

**Anaesthetic drug induced injury**

If the injury is due to anaesthetic drug then the patient will show the features of fulminant hepatitis like fever, rashes, arthralgia, hepatomegaly, jaundice, eosinophilia. Elevation of enzymes (AST/ALT) will occur only after one week that peaks by 2nd week and then declines. Immediate aggressive treatment is required for this condition.

**Infection induced liver injury**

If the injury is due to infection, then the enzymes will be elevated as per the incubation period (15-45 days). It will be definitely accompanied with symptoms of inflammation, fever, Jaundice, abdominal pain, hepatomegaly. Even here, the cause must be treated immediately.

**Mechanical injury to Liver**

In surgeries where liver retractor is applied for longer time, the mechanical pressure exerted on liver by the retractor can cause liver ischemia, injury and consequent rise in liver enzymes in the post-operative days. They have the typical picture of enzyme elevation starting from the day of surgery which gradually peaks by 3rd day then falls back to the normal level. As this is a transient elevation, the patient will be asymptomatic unlike other causes of liver injury.

The pressure applied and duration of application of retractor plays a vital role in producing injury to the organ. Prolonged pressure or higher pressure exerted causes ischemic injury and release of intra cellular liver enzymes to the blood leading to elevation of AST and ALT (Transaminases). This elevation of Transaminases during laparotomy following liver retractor application is termed as Retraction transaminitis. This is a benign transient condition which reverses completely without any residual impairment. Here in this case, the patient was absolutely asymptomatic throughout the post operative period eventhough biochemically she had elevated liver function test parameters. The pattern of Transaminase elevation observed in this case was similar to mechanical pressure induced injury to liver by retractor, and hence it was diagnosed as Retraction transaminitis. The cause for serum bilirubin elevation is probably the blood transfusion for anaemia correction. About 10% of erythro-
cytes in stored blood will undergo haemolysis within 24 hrs of blood transfusion. When 500mL of blood is transfused 7.5 g of haemoglobin is obtained and 250 mg of bilirubin is expected to be released which is handled by the liver and this causes hyperbilirubinemia for a short period of time. This explains the hyperbilirubinemia present in this patient\(^6\). Retraction transaminitis is commonly found in laparoscopic surgeries such as Gastric fundoplication\(^{2,3,4,5}\) but noted in laparotomy surgery in this case and hence should be considered in managing all (abdominal) post-operative conditions.

**CONCLUSION**

Retraction transaminitis is a transient and a very rare condition occurring <1/1000 laparotomy surgeries. This condition should be considered in evaluating high transaminase values in an otherwise asymptomatic postoperative patient. Retraction transaminitis is purely a biochemical diagnosis and does not require any treatment as the liver cells recovers quickly and the transaminases returns to baseline within a short period of time. This benign condition should be considered in the post operative management of abdominal surgeries.

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CASE REPORT - NEUROLOGY

Bronchogenic Carcinoma presenting as Neurological Manifestation

K. Mugundhan(1), K. Thiruvarutchelvan(2), S. Sivakumar(1)

Abstract

Pancoast tumour forms 1% - 3% of all bronchogenic carcinomas. A major issue with these tumours is the delay in diagnosis. This is because the tumour symptoms can be mimicked by numerous neurological or musculo-skeletal disorders. We report 2 cases of Pancoast tumours presented with shoulder pain radiating along C8, T1 distribution, with wasting and weakness of small muscles of hand and forearm and features of Horner’s Syndrome without respiratory symptoms.

Key Words Bronchogenic carcinoma, Pancoast tumour

INTRODUCTION

Pancoast tumours are a subset of bronchogenic carcinomas that invades the apical chest wall. The location of the tumour, rather than its pathology is significant in producing its characteristic clinical presentations. We report 2 cases of Pancoast tumour presented with unremitting, severe shoulder pain extending along C8, T1 dermatomal distribution with wasting and weakness of forearm and hand and with features of Horner’s Syndrome without respiratory features.

CASE REPORT

Case 1

42 year old male smoker presented with severe, unremitting pain over left shoulder and scapular region radiating along C8, T1 distribution for 2 months. Neurological examination revealed Horner’s syndrome on left side (Fig -1) and wasting and weakness of small muscles of left hand and left forearm in C8, T1 distribution (Fig -2). There was a swelling over the left supraclavicular region. MRI cervical spine (coronal STIR) showed mass lesion over the apical segment of left upper lobe of lung infiltrating into pleura, brachial plexus and soft tissues (Fig - 3). CT Chest (Bone Window) showed mass lesion eroding the rib. Fine Needle Aspiration Cytology (FNAC) from the mass showed squamous cell carcinoma.

Case 2:

52 year old male smoker presented with pain left shoulder and scapular region for 4 months. Examination revealed wasting and weakness of muscles in left C8, T1 distribution and Horner’s syndrome on left side. There was fullness over the left supraclavicular region. MRI cervical spine (coronal STIR) showed mass lesion over the apical segment of left upper lobe of lung infiltrating into pleura, brachial plexus and soft tissues. CT Chest (Bone Window) showing left upper lobe mass lesion eroding rib and vertebra (Fig - 4). Fine Needle Aspiration Cytology (FNAC) from the mass revealed clusters of large round to oval cells with large pleomorphic hyperchromatic nuclei and eosinophilic cytoplasm. The cells arranged in clusters and in single suggest squamous cell carcinoma (Fig - 5). Both the patients were treated with radiotherapy as surgery was contraindicated because of the

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*Picture published with the consent of the patient
invasion of the tumour into chest wall and soft tissues.

DISCUSSION

Henry Pancoast first described the Pancoast tumour in 1932. It is also called as Superior pulmonary sulcus tumour as mass growing at the thoracic inlet, producing a constant and characteristic clinical presentation of pain in an eighth cervical or first and second thoracic trunk distribution without pulmonary symptoms. Pancoast tumours are much less common than other lung cancers. The rate of Pancoast tumours varied from 1-3% of all lung cancers. A major issue with Pancoast tumours is the delay in diagnosis because the symptoms produced by the disorder can be mimicked by numerous neurological or musculoskeletal disorders. The risk factors are prolonged asbestos exposure, exposure to industrial elements (eg, gold, nickel), smoking, and secondary smoke exposure. The mass in superior sulcus is an extension of a lung tumour; most of it lies outside the lung and involves the chest wall, nerve roots, lower trunks of the brachial plexus, sympathetic chain, stellate ganglion, ribs and bone. Most Pancoast tumours are squamous cell carcinomas or adenocarcinomas. Only 3-5% are small cell carcinomas. The symptoms are typical of the location of the tumour in the superior sulcus or thoracic inlet adjacent to the eighth cervical nerve roots, the first and second thoracic trunk distribution, the sympathetic chain, and the stellate ganglion. Pain occurs in the shoulder and vertebral border of the scapula, later extend to the ulnar surface of the forearm and to the little and ring fingers of the hand (C8). If the tumour extends to the sympathetic chain and stellate ganglion, Horner syndrome and anhidrosis develop on the ipsilateral side of the face and upper extremity. Pain is frequently relentless and unremitting, often requiring narcotics for relief. The hand muscles may become weak and atrophic. The first or second rib or vertebrae may be involved by tumour extension and intensify the severity of pain. The spinal canal and spinal cord may be compressed, with symptoms of spinal cord tumour. Confusion with thoracic outlet syndrome and cervical disk disease is common in the early clinical course. Infrequently, a patient with a Pancoast tumour may also have features of a paraneoplastic syndrome such as Cushing syndrome, excessive antidiuretic hormone secretion, hypercalcemia, myopathies, haematological problems and hypertrophic osteoarthropathy. Other neurological manifestations of bronchogenic carcinoma include Lambert-Eaton myasthenic syndrome (LEMS), subacute sensory neuropathy, cerebellar degeneration, encephalopathy, and cerebral metastasis. Most Pancoast tumours are diagnosed histologically based on transthoracic needle biopsy results. The true Pancoast tumour is usually T3(TNM staging), which describes the extension of the tumour through the visceral pleura into the parietal pleura and the chest wall. Pancoast tumours are classified as T4(TNM staging) when mediastinal invasion, cervical invasion, or both have occurred. Peripheral metastases signal a poor prognosis, and surgery is contraindicated in such cases. Patients with superior sulcus pulmonary carcinoma should be considered for surgery. Contraindications to surgery are extensive involvement of brachial plexus, involvement of paraspinal region, involvement of lamina of vertebrae body, involvement of mediastinal lymph node and subclavian venous obstruction. The inoperable patients with severe pain after irradiation may be selectively considered for palliative resection.

CONCLUSION

Pancoast tumours are less common than other types of bronchogenic carcinomas. These tumours are frequently missed resulting in a delayed diagnosis since its presentation mimics neurological or musculoskeletal disorders. Although there are no respiratory features, rapid recognition of this condition will help prompt diagnosis and correct treatment.

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We also thank Dr. K. Gunasekaran, Dr. C. Selvaraj, Dr. D. Muthukumar, Dr. D. Manikandan, Assistant Professors, Department of Neurology, Prof. S. Sridhar, Professor, Department of Chest Medicine, Dr. A. Sivaprakasam, Dr. V. Viswanathan, Assistant Professors, Department of Chest Medicine, Government Mohan Kumaramangalam Medical College Hospital, Salem, Tamilnadu for their valuable academic guidance.
INTRODUCTION
Hirayama disease is a form of cervical myelopathy related to flexion movement of neck. The pathogenetic mechanism of this disease is attributed to forward displacement of posterior wall of the lower cervical dural canal when the neck is in flexion, which causes marked often asymmetric flattening of the lower cervical cord. We report a case of Hirayama disease and describe the pathognomonic findings at flexion magnetic resonance imaging and the possible pathogenetic mechanism of this disease.

CASE REPORT
A previously healthy 19 year old male presented with insidious onset of wasting and weakness in the left hand and forearm for the past 2 years. He also noticed twitching of muscles over that area. He denied history of weakness in his right upper limb. There was neither history of trauma nor family history of neuromuscular disease. Neurological examination revealed severe wasting and moderate weakness of left hand forearm (Figure-1). Fasciculations and polymyoclonus were present. Deep tendon reflexes were preserved. Sensation was intact. There was no extra pyramidal sign, Horner’s syndrome or abnormalities in sweating noted. EMG showed neurogenic pattern in left abductor pollicis brevis suggestive of active denervation change. Motor nerve conduction was normal. Findings were suggestive of anterior horn cell involvement of C7—T1. Non flexion cervical MRI (Sagittal T2)image revealed cord atrophy at the C7—T1 vertebral level (Figure-2). Non flexion cervical MRI (Axial T2)image revealed asymmetrical cord atrophy with hyperintense signal (Figure-3). Flexion cervical MR imaging was done because of suspicion of Hirayama disease. It revealed anterior displacement of posterior wall of cervical dural canal causing flattening of the cord (Figure-4). The clinical presentation and flexion MR images are diagnostic of Hirayama disease. A neck collar was placed to prevent neck flexion. On follow up, no further progression of symptoms noted.

DISCUSSION
Hirayama disease is a benign disorder which occurs mainly in young males between the ages of 15 and 25 years. The clinical features include insidious onset, predominantly unilateral upper extremity weakness and atrophy, no sensory or pyramidal tract involvement. Cervical flexion MRI show forward displacement of the posterior wall of the lower cervical dural canal which is presumed to be a primary pathogenetic mechanism of Hirayama disease. This has been explained by a tight dural canal in flexion, caused by a disproportional length between the vertebrae and the dural canal. The imaging findings in our case is consistent with this hypothesis. The spinal dura mater is a loose sheath that is anchored in the vertebral canal by the nerve roots and by attachment to the periosteum in two places: one at the fora-
men magnum and the dorsal surfaces of C-2 and C-3, and the other at the coccyx. The remainder of the dura mater is only suspended and cushioned in the spinal canal by the epidural fat, venous plexus, and loose connective tissues. In neck extension, the dura mater of the cervical spine is slack and thrown into accordion like transverse folds. In neck flexion, the dura becomes tighter, because the length of the cervical canal increases as the neck moves from extension to flexion. Normally, the slack of the dura can compensate for the increased length in flexion; therefore, the dura can still be in close contact with the walls of the spinal canal without anterior displacement. In Hirayama disease, the dural canal is no longer slack in extension, because of an imbalance in growth of the vertebrae and the dura mater. Therefore, a tight dural canal is formed, which cannot compensate for the

resulting from repeated or sustained flexion of the neck may produce necrosis of the anterior horns, which are most vulnerable to ischemia. In our case, we found that asymmetry is one of the most characteristic findings of this disease, both clinically and radiologically. Thus, in cases of adolescent onset of distal upper limb weakness, the finding of asymmetric cord atrophy on routine non flexion MR studies, especially at the lower cervical cord, should raise the suspicion of Hirayama disease. When this sign is seen, a flexion MR study should be performed to confirm the diagnosis.

Though Hirayama disease is self-limiting, early diagnosis is still necessary, because placement of a cervical collar will prevent neck flexion, which has been shown to stop disease progression. But in some cases, anterior cervical decompression with fusion is done if conservative treatment fails to arrest progression of the disease even after 5 years.

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ACKNOWLEDGEMENT:
1. We wish to thank Dr. V. Natarajan, Prof & Head, Institute of Neurology, Madras Medical college for his valuable academic guidance.
CASE REPORT - PSYCHIATRY

PSYCHIATRIC SYMPTOMS IN PORPHYRIA - CAUSAL? OR CO-INCIDENTAL? - A CASE REPORT

Vanishree G(1), Venkatesh Madan Kumar(2), Asokan TI(3)

Abstract

The porphyrias are a heterogenous group of inborn errors of metabolism caused by inherited, and rarely acquired, enzyme defects in heme biosynthesis pathway. The acute porphyrias are characterized by periodic attacks of neurovisceral symptoms including abdominal pain, neurologic deficits, psychiatric symptoms, and high coloured urine. Frequently, the disorder stays occult for a long time. Mental disorders occur in 24% to 80% of cases and every psychiatric symptom has been reported in literature ranging from hysteria, anxiety, depression, Obsessive Compulsive Disorders, phobias, psychosis, organic disorder to agitation and altered consciousness ranging from delirium to somnolence and coma. Despite standard laboratory tests and genetic screening, in the majority of patients, the onus of diagnosis, lays with skilful and thorough history taking. Key words Acute Intermittent Porphyria, Mental symptoms in AIP

INTRODUCTION

The term Porphyria is derived from the ancient Greek word “porphura”, meaning purple. 1 Porphyrias are precursors of heme, an integral part of key biological moieties - Haemoglobin and Cytochrome P 450. Majority of the porphyrias are autosomal dominant disorders. They result in accumulation and increased excretion of porphyrins and their precursors, (2,3) Porphyrias can present as acute or chronic syndromes. Both syndromes differ distinctly in their presentations as a result of the difference in the level of the enzymatic defect in the biosynthetic pathway. If the enzymatic defects are in the initial steps of the metabolic cascade, early metabolic intermediates will accumulate (Aminolevulinic acid [ALA] and Porphobilinogen [PBG]), which are responsible for attacks of neurologic dysfunction. If the enzymatic defects are in the final steps, sunlight-induced cutaneous lesions (photosensitivity) due to porphyrin accumulation in the skin will develop. (4,5) Commonest among the acute porphyrias is Acute Intermittent Porphyria (AIP). It is an autosomal dominant disorder with incomplete penetrance, meaning, as few as 10% of the AIP gene carriers eventually develop the clinical syndrome. (5) The defective gene, mapped to chromosome 11, results in a 50% reduction of porphobilinogen deaminase activity. (6) Acute attacks are most common during the second to fourth decades and are often triggered by exposure to exogenous precipitating factors, mainly drugs. (7,8) Women are affected five times more often than men. (9) Mental disorders accompany attacks in 24% to 80% of cases (10). Almost every psychiatric symptom has been reported in literature ranging from schizophrenia, anxiety, depression, OCD, phobias, hysteria, organic disorder to agitation and altered consciousness ranging from delirium to somnolence and coma. 10 Conduct disorder, encopresis and hyperactivity have been reported in one case report. Delay in diagnosis may result in serious neurological and mental sequelae, sometimes death.

The prevalence of AIP in the general adult population ranges between 1 and 8 per lakh. (11) Tishler et al has reported the overall prevalence of AIP in the psychiatric population to be 210 per lakh (12). Although the diagnosis of porphyria is seldom made, it is still underdiagnosed due to a lack of suspicion about the condition, lacunae in the history collected from patients and their families, and a lack of adequate investigative facilities. An interesting presentation in a female patient referred to our Psychiatry Out-Patient Department is discussed below. She had been diagnosed of Acute Intermittent Porphyria in the past and had presently been referred for her psychiatric sympatomatology.

CASE REPORT

Mrs X was a 24 year old housewife, Hindu by religion, belonging to low socio-economic status, educated up to XII. She came to Psychiatry OPD in June 2012, with complaints of difficulty in falling asleep and unexplained fear, of 2 months duration. Symptoms began acutely following the death of a young boy in the neighbourhood. She started experiencing a fear of being followed by the spirit of the dead boy. Her sleep was disturbed. She would wake up in the middle of the night and check if there was anyone

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like sensation had also resolved. Patient was advised to continue treatment and come for regular follow-up.

DISCUSSION

We would like to discuss the difficulties in diagnosis, in 3 distinct clinical scenarios.

First, a patient with an undiagnosed latent porphyria can present exclusively with psychiatric symptoms. The patient might have suffered previous psychiatric episodes of a different kind, adding to the diagnostic confusion. There is frequently a precipitating stressor, which equally favours the diagnosis of a primary psychiatric illness. The diagnosis of porphyria is often missed. If at all porphyria was suspected, the patient needs referral to a specialised centre equipped with the required laboratory, for testing. This process takes a few days to weeks and in the meantime, the patient in all likelihood, is started on a psychotropic drug which might be unsafe, leading to an unfavourable outcome.

Second, a patient with an established diagnosis of porphyria can present with a psychiatric symptom, like our patient. In order to establish that the clinical symptom is indeed caused by the accumulation of porphyrin precursors in the body, it is imperative to demonstrate their elevated levels, at the time of presentation. A routine testing for porphyria may prove deceptive, for the following reasons. The levels of porphyrin precursors fall to 50% within 24 hours, if the sample is exposed to normal lighting. Also, their levels in vivo often normalise within a few days. Therefore, the tests should preferably be done on the first day of appearance of a symptom, which is not feasible in many patients. In such cases, a past history of porphyria only serves to provide additional information regarding the patient, rather than offering a diagnostic clue. With the available past history, the pattern of onset and progress of current symptomatology we concluded that our patient had indeed suffered an acute attack of porphyria, clinically presenting with psychiatric symptoms.

Third, it is possible that both porphyria and the psychiatric disorder are only innocent comorbidities, with no etiological or pathophysiological connection whatsoever. As psychiatrists, many of us have the tendency to blame the current psychiatric syndrome on an underlying medical disorder, however innocuous the medical condition might be.

Not infrequently, the psychiatric illness remits rapidly (like in our case) and the psychiatrist is often left wondering whether the rapid abatement of symptoms is a result of the antipsychotic efficacy, or the termination of an acute attack of porphyria, or a natural remission in the course of a co-occurring unrelated psychiatric illness.

CONCLUSION

AIP mimics a variety of disorders, thus posing...
a diagnostic labyrinth. The challenges in diagnosis still remain daunting, despite the enormous technical advances in genetic screening, imaging studies and molecular biology. Furthermore, there is a dearth of information on the safety of psychotropic drugs especially newer antipsychotics and antidepressants, in the management of acute mental symptoms in porphyria. The current psychiatric literature porphyria is limited to single case reports and small case series. These reports have claimed safe use of sertraline, fluoxetine, venlafaxine, olanzapine, risperidone, clozapine, buspirone, trazodone, lorazepam, and clonazepam in a patient with documented acute intermittent porphyria 14. which offers only limited help.

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INTRODUCTION:
Amyand’s hernia is a rare condition and was named after a famous England surgeon Claudius amyand who first described a case of acute appendicitis in an inguinal hernial sac in an eleven year old child in 18th century[1]. Mucocele appendix is defined as a cystic dilatation of the appendix with dilated lumen containing mucus substance. Mucocele appendix can be either benign or malignant. Pre operative diagnosis of both the condition is difficult to make. Both the conditions are usually diagnosed intra operatively. Both conditions occurring together is another rare phenomenon.

CASE HISTORY
55 year male patient came with chief complaints of swelling in the right inguinal region for the past 3 months duration. Swelling was insidious in onset and gradually increased in size. Patient also had history of pain over the swelling which was episodic and pricking in nature. On examination there was a swelling in right inguinal region of size 6 x 4cm which was pyriform shaped, soft in consistency and was reducible manually. High frequency ultrasound revealed hernia sac with bowel as its content. We diagnosed the patient with right sided inguinal hernia and proceeded with surgery. The per op findings was an indirect inguinal hernia with enlarged and thickened appendix adhered to the sac as its content. We proceeded with appendectomy and followed by mesh repair. On opening the specimen there was mucus like substance present inside the appendix. Post op was uneventful. Histopathology report of appendix was diffuse mucosal hyperplasia without atypia suggestive of mucocele appendix.

DISCUSSION:
A hernia is defined as a protrusion of a viscus or...
part of a viscus through the walls of its containing cavity \[^3\]. It commonly occurs in the inguinal region, where the hernial sac may contain the omentum or small bowel \[^3\]. Amyand’s hernia is one of an extremely rare condition in which the inguinal hernial sac contains the appendix. Its incidence is only one percent of adult inguinal hernia cases \[^1\]. Mucoccele appendix on the other hand is a result from chronic appendiceal obstruction that may be caused by either benign or malignant lesions:

- Mucosal hyperplasia
- Mucinous neoplasms
- Carcinoid appendix
- Adjacent caecal tumour \[^3\]

Mucoccele is found in 0.2–0.3% of all appendectomy specimens \[^2\]. The male:female ratio is 1:4 and the mean age of patients is around 55 year \[^2\].

**CONCLUSION**

Our patient is interesting because of the two associated conditions while one of them (Amyand’s hernia) second case to be mentioned in literature in association with mucoccele appendix.

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Thanks to my institute, IGS, Madras Medical College for their support.
Finally, Dr. Daniel Ravikumar and Dr. Prabhakaran for their valuable assistance.
INTRODUCTION:
Cysticercosis infection in humans is caused by Taenia Solium [1]. The cysts occur first in central nervous system [2] followed by the eye, striated muscles, subcutaneous tissue and rarely in other locations. To our knowledge presence of isolated cysticercosis infection is rare [3-6]. Now we present this case of isolated cysticercosis of foot which was misdiagnosed on Magnetic Resonance Imaging (MRI) as fibromatosis and resolved successfully on treatment with wide local excision and albendazole.

CASE HISTORY
A 32 yrs old female predominantly non-vegetarian presented to our outpatient department with complains of pain and swelling on the dorso medial aspect of left foot for past two months. Patient had history of trivial trauma to the foot. She was given symptomatic medications but swelling was persistently progressive. There were no other constitutional symptoms. On examination there was erythema and edema to the skin over the dorsal and plantar aspect of the foot. On palpation swelling is ovoid tender, 3x4cm with ill-defined margins, non pulsatile, not adherent to skin. No restriction of adjacent joint movements. All the blood counts were normal with mild increase in Erythrocyte sedimentation rate. No other positive laboratory reports noted. MRI foot showed features suggestive of plantar fibromatosis. CT brain done to rule out any cerebral lesions suggested normal study. Patient was taken for wide local excision procedure. Gritty fibrous tissue like white chalk like sediments excised within the tissue specimen raw area covered with split skin graft. HPE report suggested plantar cysticercosis. She was managed with anti-helmentic drug Albendazole 15mg/kg/day in two divided doses for three weeks, along with analgesics. Patient was followed on every third day for three weeks. Pain and edema of foot subsided in a week. After one and half month patient was completely relieved of symptoms.
Cysticercosis infection in humans is caused by Taenia Solium [10]. It is common in Asians (mostly Indians) and African low socio economic status population where the pigs are raised for consuming purpose [27]. In the life cycle of tape worm humans are the definitive host for tape worm infection and the tape worm enters humans generally through inadequately pork or beef consumption. Ingested eggs hatch in the small intestine, releasing oncospheres that penetrate the bowel mucosa and enter the bloodstream to travel to various tissues where they develop to form an encysted larval form of T. Solium known as cysticercosis cellulosae. When the larva dies, it induces an aggressive granulomatous inflammatory response, leading to characteristic organ-specific symptoms. The cysts occur first in central nervous system followed by the eye, striated muscles, subcutaneous tissue and rarely in other locations. Presence of multiple muscular cysts and isolated involvement in foot is rare. So this case can be considered as a rare disease at a rare location. Mostly this type of cysticercosis infection in foot is a rare in possibility. This case mostly goes unnoticed and will be asymptomatic. The swelling is due to release of antigens after the death of disease. In our case trivial trauma to the foot in the region of cyst which was unnoticed might have caused the release of antigens resulting in inflammation. Three different clinical manifestations of muscular cysticercosis are described: myalgic myopathic type; the nodular or mass like type; and the pseudohypertrophy type in which multilocular cyst formation occurs in groups of muscle [10]. The myalgic type results from death of the cyst and leakage of fluid leading to inflammation. The nodular type or pseudotumor type both result from degeneration of the cyst and slow intermittent leakage of fluid over time, leading to a chronic inflammatory response with collection of fluid around the cyst producing a mass. This case is a myalgic variant. Del Brutto et al proposed diagnostic criteria for human cysticercosis [10] they suggested that apart from Immunochemical studies (including detection of anticysticercal antibodies), CT and MRI are important tools in diagnosis. Although MRI is more specific for neurocysticercosis, CT may be the modality of choice for muscle cysts as it can demonstrate multiple cysts in a honeycomb or leopard skin pattern against a background of muscle mass. Treatment of cysticercosis depends on the site involvement. It is generally treated with antiparasitic drugs in combination with inflammatory drugs [11]. Surgery is sometimes is necessary to treat cysts in certain locations when patient is not response to drug treatment. Anti helminth drugs (Albendazole) acts by inhibiting microtubule formation. The loss of cytoplasmic microtubules blocks glucose uptake in the larval and adult stages of the parasites, thereby depleting their energy reserves and causing death; in our case as lesion was refractory to medications wide local excision along with albendazole and anti inflammatory drugs successfully helped in resolving the disease.

**DISCUSSION:**

**CONCLUSION**

Plantar Cysticercosis is a rare diagnosis. Even MRI can provide a mis-diagnosis that has to be kept in mind. Surgical management might be mandatory for these cases refractory to medications. With non availability of vaccines preventive measures like proper personal and environmental hygiene, Avoiding in adequately cooked foods are the keys to protect us from this disease.

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INTRODUCTION:

Annular pancreas is a rare congenital anomaly of the pancreatic ducts. This malformation in adults is usually asymptomatic, but can manifest as pancreatitis, duodenal stenosis, or duodenal or gastric ulceration. Its variable presentations have made the diagnosis and management challenging. We hereby discuss our experience with a case due to the rarity of this congenital abnormality and its successful management. A 70-year-old male presenting with history of vomiting and weight loss. General physical examination was essentially normal. Abdominal examination did not reveal any mass or any organomegaly. Ultrasonography of the abdomen was normal. Upper gastrointestinal endoscopy revealed an congested D1 mucosa with multiple small irregular ulcers. There was luminal narrowing at the level of D2 arising as a result of extrinsic compression. An abdominal CT revealed a ring of pancreatic tissue encircling the second part of duodenum. Surgical management in the form of bypass procedure done through a gastro jejunostomy, and follow-up of the patient. The patient had a normal and uneventful post operative course.

A RARE CASE OF ANNULAR PANCREAS - ITS DIAGNOSTIC AND TREATMENT CHALLENGES

Murali Ramamoorthy(1), Tony Fredrick(2), Venkateswaran A R(3), Jeswanth S(4), Yuvaraj Jayaraman(5), Joseph k David(6)

Abstract

Annular pancreas is a rare congenital anomaly of the pancreatic ducts. This malformation in adults is usually asymptomatic, but can manifest as pancreatitis, duodenal stenosis, or duodenal or gastric ulceration. Its variable presentations have made the diagnosis and management challenging. We hereby discuss our experience with a case due to the rarity of this congenital abnormality and its successful management. A 70-year-old male presenting with history of vomiting and weight loss. General physical examination was essentially normal. Abdominal examination did not reveal any mass or any organomegaly. Ultrasonography of the abdomen was normal. Upper gastrointestinal endoscopy revealed an congested D1 mucosa with multiple small irregular ulcers. There was luminal narrowing at the level of D2 arising as a result of extrinsic compression. An abdominal CT revealed a ring of pancreatic tissue encircling the second part of duodenum. Surgical management in the form of bypass procedure done through a gastro jejunostomy, and follow-up of the patient. The patient had a normal and uneventful post operative course.

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parameters were within normal limits. Abdominal examination did not reveal any mass or any organomegaly and did not contribute significantly. Routine investigations revealed no specific abnormality. Abdominal x ray shows distended stomach, Routine biochemical and haematological investigations were within normal limits. Ultrasonography of the abdomen was normal. Upper gastrointestinal endoscopy revealed, congested D1 mucosa with multiple small irregular ulcers. There was luminal narrowing at the level of D1- D2 arising as a result of extrinsic compression. A biopsy was taken, which was negative for malignancy. The differential diagnosis was annular pancreas versus duodenal web, or a combination of both. Computed tomography (CT) scanning showed an annular pancreas encircling the second part of the duodenum. Laparotomy was undertaken which showed that the second part of duodenum was completely encircled by a band of pancreatic tissue causing near total obstruction confirming the diagnosis of annular pancreas, gastro-jejunostomy was done. The patient had a normal and uneventful post operative course. He was discharged on the 10th postoperative day on full oral diet. The patient was completely asymptomatic on follow up and had gained weight.

**DISCUSSION :**
Annular pancreas is associated with a spectrum of disease that differs in children and adults[7]. In this malformation the head of the pancreas lies in its customary position in the bend of the duodenum. From this head two arms of pancreatic tissue extend around the second part of the duodenum, one anteriorly and one posteriorly[12]. These usually fuse to form a complete encircling mass, but if a gap occurs between the two arms it is apt to appear anteriorly. Such a ring of pancreatic substance almost invariably produces, or is accompanied by, some degree of constriction in the duodenum[14, 12]. If this blockage is minimal, there is little or no associated evidence of intestinal obstruction. If, however, the constriction is marked, the proximal duodenum would be dilated and its wall hypertrophied. In rare instances, there would be an atresia of the duodenum at the level of the pancreatic ring[12]. Although annular pancreas may encircle the duodenum completely in adults, food usually can pass through the duodenum without trouble[13]. However, the cause of the obstruction may be related to ulceration as a result of compression and obstruction from the annulus to the duodenum secondary to chronic pancreatitis. Some of the patients who presented with gastric outlet obstruction had coexisting peptic ulcer disease (PUD)[14]. Our case report describes late presentation of an annular pancreas with vague abdominal symptoms. This may point towards the diagnosis of a duodenal web anomaly that might explain the patient’s symptoms.

Image 1 (sagittal image) : Cross sectional enhancing lesion in the D2 duodenum causing marked luminal narrowing.

Duodenal web anomalies in more than one-third of patients do not manifest signs or symptoms until adulthood[7, 13, 14]. The lesion can be asymptomatic or present as gastric outlet obstruction, resulting in antral dilation and secondary hypergastrinemia commonly associated with PUD. Patients with annular pancreas have preampullary duodenal obstruction, which is more commonly partial[13]. The spectrum of clinical presentation in adult population is however quite variable. Although annular pancreas may encircle the duodenum completely in adults, food usually can pass through the duodenum without trouble[14, 15]. However, the cause of the obstruction may be related to ulceration as a result of compression and obstruction from the annulus to the duodenum secondary to chronic pancreatitis. In these cases, the level of the stenosis was at or above the papilla of Vater, suggesting the annulus prevented the passage of alkaline secretions from the bile duct and pancreas, but patients with duodenal stenosis below the papilla have no ulcer, nor do patients without duodenal stenosis[14]. The annular portion of pancreatic substance has all of the histological characteristics of a normal pancreas[14]. It contains islet as well as acinar tissue. The ducts for the external secretions have been the subject of considerable investigation. They may be rudimentary and may run from the anterior part of the ring towards the left to join the main pancreatic duct. However, it is more customary for the annular part of the pancreas to be traversed by a major duct which begins anteriorly, runs to the right, and then curves around
laterally and posteriorly; finally, to join either the common bile duct or the main pancreatic duct [17]. In some of these cases the lower portion of the common duct passes through the posterior portion of the annular pancreas and is obstructed either by constriction or angulations.

Image 2 cross sectional: enhancing lesion in the D2 duodenum causing marked luminal narrowing: possibility of annular pancreas

Annular pancreas was first described by Tiedman, and named by Ecker [15,18]. About 737 cases of annular pancreas have been reported in the literature [11]. The classification system proposed in the Canadian surgical literature in the 1970s with extramural (type 1) annular pancreas causing symptoms of gastric outlet obstruction, and intramural ring (type 2) related to presentation more consistent with PUD [19]. The radiological sophistication, diagnosis may require surgical confirmation. The use of contrast enhanced computed tomography (CECT) in infants is limited by the paucity of abdominal fat which serves as a reference for enhancement. The use of CECT in adults is limited by the narrowness of the ring and by the fact that the pancreatic ring may lie intramural in the duodenum without any plane existing in between. Nowadays, CT scan allows us to see the pancreatic ring encircling the duodenum [2]. The echo endoscopy also allows approaching the diagnosis by showing the ring of normal pancreatic tissue encircling the duodenum, but the pancreas MRI remains the most reliable diagnostic tool and allows to highlight the presence of a pancreatic duct encircling the duodenum [2]. The echo endoscopy also allows approaching the diagnosis by showing the ring of normal pancreatic tissue encircling the duodenum, but the pancreas MRI remains the most reliable diagnostic tool and allows to highlight the presence of a pancreatic duct encircling the duodenum [2]. ERCP is invasive and can precipitate/exacerbate pancreatitis, besides the presence of a narrowed lumen may preclude its use. Use of MRCP is limited by the fact that it requires a dilated ductal system [21]. The diagnosis of annular pancreas used to be based on duodenography which showed a medio duodenal stenosis corresponding to the pancreatic ring [22]. Endoscopic retrograde cholangiopancreatography (ERCP) can also make the diagnosis, but it remains invasive and sometimes impossible in case of an uncrossable stenosis of the duodenal lumen [22, 23]. However, in over 40% of cases, the diagnosis is only made at laparotomy [22].

The treatment of symptomatic, obstructing annular pancreas has classically been surgical. The first surgical treatment for an obstructive annular pancreas was performed by Vidal in 1905 [24]. Its aim is relief of the duodenal obstruction. For this, there are various procedures being used and the preferred treatment are case based and it can be a bypass operation such as gastro- or duodenojejunostomy, but some cases were treated by division of the annulus with transverse duodenopasty, duodenoduodenostomy, or Whipple’s procedure in extreme cases, depending on the case and the intra-operative findings [25]. Duodenoduodenostomy is the appropriate treatment. The first aim of the surgery is to directly attack the obstruction by dividing or removing a portion of the annular pancreas despite the associated hazards of pancreatic or duodenal fistula [7, 25, 26]. Furthermore, the division of the annular pancreas is often followed by persistent symptoms, particularly abdominal pain (up to 50% of cases) [25]. On the other side, the majority of surgeons have elected to bypass the obstruction by establishing a gastrojejunostomy, a latero-lateral anastomosis of the first part of the duodenum with the jejunum, or a duodeno-jejunal anastomosis with Roux en Y loop [16, 25]. The frequent association of peptic ulcer and the risk of anastomotic ulcer suggest the need for a procedure like vagotomy which reduces acid secretion by the stomach therefore surgery for annular pancreas should include vagotomy and gastrojejunostomy and avoid the duodenum and the annular pancreas [23, 25]. Although pancreatic resection is associated with a higher incidence of complications as pancreatitis, pancreatic fistulae and pancreatic insufficiency [27]. Even the minor degrees of pancreatic leaks that go unnoticed on a gross level can cause an intense local inflammatory response which can induce an intense local inflammatory and fibrotic reaction causing variable degree of luminal compromise of surrounding structures. Pancreatic resection is reserved to those rarest cases where malignancy cannot be excluded [28].

CONCLUSION:

In spite of annular being rare we should keep it in mind to exclude other common causes of gastric outlet obstruction. Diagnosis is by upper GI series, abdominal CT scan, ERCP, MRCP, endoscopic ultrasound. In annular pancreas surgery is considered diagnostic gold standard. The management of this anomaly should be individualized
according to the associated complications. Symptomatic patient are treated with bypass surgery of annulus which can be achieved via duodenoduonostomy, gastrojejunostomy or duodenojejunoostomy.

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Splenic cysts diagnostic and treatment challenges

Abstract

Aim: Splenic cysts are a rare entity. Diagnosis can usually be established with the clinical context and imagery. They are generally considered as either true epithelial cysts or false pseudo cysts. The management mainly performed to prevent infection, haemorrhage, or rupture of the cyst. Discussion: 22-year-old female presented to the medical gastroenterology department with 4 months history of left hypochondrial pain. She denied any history of abdominal injuries, dyspepsia and constipation in the past. Base line laboratory investigations including haemoglobin, complete blood count were normal. Serological tests for HBsAg and HIV were nonreactive. Indirect haemagglutination test and enzyme-linked immunosorbent assay for detection of anti-Echinococcus antibodies were negative. On contrast CT scan of whole abdomen a large exophytically bulging well defined cystic lesion is seen measuring 12x10x10cm and replacing upper and mid part of spleen, extending superiorly up to left dome of diaphragm, medially indenting posterior and lateral wall of stomach and indenting the tail of pancreas. She underwent laparoscopic deroofing. Cyst measuring 15x10x10 cm was received in laboratory for histopathological examination. Microscopic examination revealed a true cyst with thin fibrous wall and a lining of cuboidal epithelium, chronic inflammatory cells infiltration and haemorrhage. There is no evidence of atypia or malignancy, the features are consistent with Primary epithelial cyst of the spleen. The postoperative course was uneventful and the she was discharged after 4 days of operation. Conclusion: Splenic epithelial cyst is an uncommon entity, it should be considered in the differential diagnosis of an abdominal mass in a young individual. Histopathology helps in the diagnosis and can help rule out the infectious and malignant differentials. Resection should be as limited as possible in order to avoid the risks of total splenectomy. Partial laparoscopic decapsulation is an advantageous approach to large splenic cysts in children, because it is effective, preserves splenic tissue, and provides good medium-term result.

INTRODUCTION

Cysts and tumours of the spleen are rare and are often discovered incidentally[1]. Splenic cysts are far more common than solid lesions. Nonparasitic cysts of the spleen are classified as primary or epithelial cysts if their inner surface has a cellular lining[2]. They are most often asymptomatic but may present with abdominal pain in the left upper quadrant.

CASE PRESENTATION

22 year old female presented to the medical gastroenterology department with 4 months history of left hypochondrial pain. She noted a lump in his abdomen which was easily palpable in the left upper quadrant and moved on respiration. She denied any history of abdominal injuries, dyspepsia and constipation in the past. On examination she was found to have tenderness and a diffuse palpable lump in left hypochondriac and lumbar region without any definite margins. Hypo resonance and reduced breath sounds at the base of his left chest were associated with a raised left hemi diaphragm on the chest radiograph. Base line laboratory investigations including haemoglobin, complete blood count were normal. Serological tests for HBsAg and HIV were nonreactive. Indirect haemagglutination test and enzyme-linked immunosorbent assay for detection of anti-Echinococcus antibodies were negative. On contrast CT scan of whole abdomen a large exophytically bulging well defined cystic lesion is seen measuring 12x10x10cm and replacing upper and mid part of spleen, extending superiorly up to left dome of diaphragm, medially indenting posterior and lateral wall of stomach and indenting the tail of pancreas. She underwent laparoscopic deroofing. Cyst measuring 15x10x10 cm was received in laboratory for histopathological examination. Microscopic examination revealed a true cyst with thin fibrous wall and a lining of cuboidal epithelium, chronic inflammatory cells infiltration and haemorrhage. There is no evidence of atypia or malignancy, the features are consistent with Primary epithelial cyst of the spleen. The postoperative course was uneventful and she was discharged after 4 days of operation.
DISCUSSION

Splenic cysts are classified as primary or secondary cysts, according to the presence of an epithelial lining\(^{(3)}\). The treatment of splenic cysts is a difficult challenge to surgeons and physicians. True cysts account for around 10% of non-parasitic cysts, but they are the most frequent type of splenic cysts in children\(^{(6)}\). Secondary cysts usually are pseudo cysts thought to result from trauma inflammation and vascular insult to the spleen. The likelihood of masking a malignant lesion remains exceedingly small, less than one per cent\(^{(5,6)}\). They present with local or referred pain which is often postural. The signs and symptoms relating to splenomegaly, abdominal distension and compression of nearby structures.

They may lead to clinical presentation like early satiety, vomiting, dysphagia, left lower lobe pneumonia and atelectasis\(^{(10)}\). They usually are discovered incidentally in childhood or adolescence\(^{(8)}\). Occasionally, they present as a palpable left upper quadrant mass which may cause epigastric fullness or dull pain. Cysts may be an incidental finding on radiographs when calcified or on ultrasound\(^{(9)}\). They may includes cystic lesions of adjacent organs, example: pancreas, liver and omentum, intrasplenic aneurysm and benign and malignant splenic tumours. Radiological investigations like ultrasound or CT scanning or MRI may help in identifying the morphology, composition of cystic fluid and their location in spleen but the final diagnosis depends on the histopathological examination of the cyst\(^{(10,11)}\). Although less common in developed countries, the possibility of a parasitic aetiology should be considered and echinococcal serology performed. Splenic epithelial cysts are “true” cysts as they possess an inner epithelial lining, in contrast to “false” cysts which have no cellular lining, and are usually related to prior trauma\(^{(12)}\).

The pseudo cyst is thought to result from trauma, haemorrhage or infarction. The relationship of trauma in the pathogenesis of splenic cysts is still unclear\(^{(5)}\).

In the past, they were usually diagnosed at operation and definitive treatment entailed splenectomy\(^{(13)}\). They were performed to prevent infection, haemorrhage, or rupture of the cyst. The diagnosis of splenic lesions could be lymphangioma, haemangioma, hydatid cyst, bacterial abscess, cystic metastasis and intrasplenic pancreatic pseudo cyst\(^{(14)}\). However, with the realisation of the role of the spleen in protection against infection, the desirability of and indications for splenectomy have been re-evaluated. This is particularly important in tropical countries where post-traumatic cysts are relatively common and splenectomy may be fatal in patients chronically exposed to malaria\(^{(15)}\). If at all possible, part of the spleen should be conserved. This may be achieved by cyst excision and splenorrhaphy\(^{(16,17)}\) or, alternatively, partial cyst excision and marsupialisation, a technically simpler procedure\(^{(18)}\). Laparoscopic decompression of a splenic cyst by the creation of a cyst-peritoneal window has also been reported effective\(^{(19)}\). One or other technique would almost certainly now be attempted in our second patient. If the cyst occupies most of the spleen, as in our third patient, splenectomy may be unavoidable. Percutaneous drainage of splenic cysts is associated with a high incidence of infection, bleeding and cyst re accumulation and injection of sclerosant produces pain and fever with little additional benefit\(^{(20,21)}\).

Image 1: Cross section : splenic cyst

Image 2: sagittal section: splenic cyst
This case is reported because of the rarity of the type of cyst and because it presents such characteristic findings as young age group. The absence of acute symptoms except for the space occupying lesion in upper abdomen, its recent rapid growth and vague abdominal pain. Though splenic cyst is an uncommon entity, it should be considered in the differential diagnosis of an abdominal mass in a young individual. Histopathology helps in the diagnosis and can help rule out the infectious and malignant differentials. Symptoms are usually correlated to the size of the cyst. The cysts usually presented with an abdominal mass and abdominal pain only if they were greater than 8 cm in size. Prior to surgery, imaging with ultrasound and computer tomography or magnetic resonance should be performed. Routine laboratory tests are usually normal. Hematologic and parasitic disorders of the spleen should be ruled out. Plain films of the chest and abdomen are usually normal; however, calcification may be present within the mass. Calcifications are common in hydatid cysts and also occur in post-traumatic inflammatory pseudo cysts, but are rare in true splenic cysts. A cyst puncture should be conducted for diagnostic purposes (amylase and bacteria) as well as to reduce the size of the cyst, the ultrasonography was the most cost-effective and least invasive method of evaluation. Splenic preservation by hemisplenectomy or cystectomy, used to avoid the long-term risks of splenectomy, proved to be a safe, easy procedure, with maintenance of splenic function. Partial laparoscopic decapsulation is an advantageous approach to large splenic cysts in children, because it is effective, preserves splenic tissue, and provides good medium-term results. Surgeons should make every possible effort to preserve splenic tissue and spleen-saving techniques with laparoscopic techniques are recommended.

REFERENCES
INTRODUCTION
Fanconi Bickel syndrome (FBS) is a rare type of Glycogen storage disorder (TYPE XI) characterized by Hepatorenal glycogen accumulation, proximal renal tubular acidosis with Impaired glucose utilization. Though western world has reports of these cases, there is paucity of such literature from India. Here we report a 10-year-old boy who presented at 3 years of age with Delayed milestones, seizures, abdominal distension and limb deformities. Examination showed short stature, doll like facies, florid rickets and massive hepatomegaly. Investigations confirmed the diagnosis of FBS by fasting hypoglycemia, hypophosphatemic rickets, glycogen-laden hepatocytes and proximal RTA. Following great ordeal for the diagnosis, management of his multiple metabolic problems posed several challenges due to no availability of readymade supplements in India which are freely available in the west . To maintain a delicate balance of urine pH, electrolytes, calcium and phosphorus a tailor made adjustments of dosages of bicarbonates, Joulie’s solution had to be made. His resistant hypoglycemia required frequent meals and cornstarch feeds. Currently at 10 years of age his hypoglycemia and RTA are settled but his Short stature and rickets are still persisting. Here we highlight the challenges faced right from diagnosis until specific management strategies and also the successful follow-up of the child for the last 7 years.

CASE HISTORY
A three year old boy born of a second degree consanguineous marriage, presented with complaints of failure to thrive, progressive abdominal distention, several episodes of generalized seizures - predominantly early in the morning, polyuria and limb deformities of a years’ duration. His auxology showed microcephaly, protein energy malnutrition and disproportionate short stature. He had a doll like facies with low set ears, florid rickets (rachitic rosary, Harrisons sulcus, widened wrists, genu valgum). Abdominal examination revealed a massive, non tender, firm hepatomegaly with a liver span of 10cm. Other systemic examination and visual acuity were normal. There was history of two siblings death in the family due to similar unevaluated illness. He had an uneventful birth history and did not have postnatal problems like seizures, jaundice or cataract. His developmental milestones were slightly delayed. Initial investigations showed a fasting hypoglycemia (31mg/dl) with postprandial hyperglycemia (196mg/dl) and normal insulin levels. Serum calcium was normal (9.4 mg/dl) with reduced serum phosphorus (1.5 mg/dl) and elevated serum alkaline phosphatase (1958 U/L). X-ray wrist showed features of rickets. However serum levels of 25(OH) Vitamin D3, 1.25 dihydroxy Vitamin D3 and Parathormone were normal, a picture suggestive of hypophosphatemic rickets. Serum cholesterol (350mg/dL), and triglycerides (322 mg/dL) were elevated. Serum electrolytes, Renal function tests, lactate, uric acid levels and thyroid profile were within normal range. ABG revealed a normal anion gap metabolic acidosis (pH:7.2, bicarbonate: 18 mmol/l). Urine was acidic (pH:4) with evidence of glucosuria (3+), proteinuria (3+), generalized aminoaciduria and calciuria.

Abstract
Fanconi Bickel syndrome (FBS) is a rare type of Glycogen storage disorder (TYPE XI) characterized by Hepatorenal glycogen accumulation, proximal renal tubular acidosis with Impaired glucose utilization. Though western world has reports of these cases, there is paucity of such literature from India. Here we report a 10-year-old boy who presented at 3 years of age with Delayed milestones, seizures, abdominal distension and limb deformities. Examination showed short stature, doll like facies, florid rickets and massive hepatomegaly. Investigations confirmed the diagnosis of FBS by fasting hypoglycemia, hypophosphatemic rickets, glycogen-laden hepatocytes and proximal RTA. Following great ordeal for the diagnosis, management of his multiple metabolic problems posed several challenges due to no availability of readymade supplements in India which are freely available in the west. To maintain a delicate balance of urine pH, electrolytes, calcium and phosphorus a tailor made adjustments of dosages of bicarbonates, Joulie’s solution had to be made. His resistant hypoglycemia required frequent meals and cornstarch feeds. Currently at 10 years of age his hypoglycemia and RTA are settled but his Short stature and rickets are still persisting. Here we highlight the challenges faced right from diagnosis until specific management strategies and also the successful follow-up of the child for the last 7 years.

Key-words Glycogen storage disorder, Hypophosphatemic rickets, Proximal renal tubular acidosis.
(spot calcium / creatinine ratio 5.6), suggestive of proximal renal tubular acidosis. Abdominal Ultrasonography showed massive hepatomegaly. Liver biopsy showed marked accumulation of glycogen in the hepatocytes thus confirming a glycogen storage disorder. The triad of hypophosphatemic rickets, Proximal renal tubular acidosis and features of glycogen storage disorder conglomerated to the diagnosis of syndrome of Fanconi Bickel. The child was commenced on treatment with oral vitamin D2 supplementation (2000 IU/kg/24 hr as a single daily dose) with oral calcitriol 0.5 mcg once a day and oral phosphate supplementation (0.6 g/24 hr) given as Joulie’s solution (given 5 times daily) and oral bicarbonate supplementation (6 mEq/kg/24 hr) given as soda mint tablets (300 mg three times a day). The mother was advised to withhold milk and to give corn starch meals at 12 mid night and early in the morning at 5am to combat hypoglycemia. Due to lack of feasibility in procuring Joulie’s solution and intolerance to indigenously prepared supplements, oral phosphates were supplemented in the form of proctoclysis enema liquid given through a oral route (5 ml every 6 hours). The child is compliant with the drug regimen and is on regular follow up. Currently he is 10 years old and his seizures and metabolic acidosis are under control and is able to attend regular school with improving scholastic performance but his anthropometric indices still remain below the third centile (At 10 years – Weight is 15.6 kg, height of 88.5 cm) and skeletal deformities persist.

**DISCUSSION**

Fanconi Bickel syndrome (FBS) is a single gene disorder (OMIM 227810) caused by defects in the facilitative glucose transporter 2 (GLUT2 or SLC2A2) gene mapped on chromosome 3q26.1-26.3, that codes for glucose transporter protein 2 expressed in hepatocytes, pancreatic beta cells, enterocytes and renal tubular cells. Globally, 112 cases of FBS were reported. Very few were reported from India and as per our knowledge only two cases were reported from South India. In our case the striking feature at presentation was the florid rickets which required evaluation. The presence of consanguinity in affected families suggest an autosomal recessive pattern of inheritance. FBS is clinically heterogenous and has marked phenotypic variability. In our case also sibling of the index child died with severe manifestation of disease. With the early age of onset, fairly normal diet history and adequate exposure to sunlight especially with a sibling death due to a similar illness the possibility of nutritional rickets was unlikely. A laboratory picture of a normal serum calcium, low phosphates with elevated alkaline phosphatase associated with a normal Vitamin D2, D3 and Parathormone levels in our child confirmed the presence of hypophosphatemic rickets. The associated findings of a hyperchloremic metabolic acidosis with normal anion gap, acidic urine, with glucosuria, proteinuria, aminoaciduria and calciuria were suggestive of proximal renal tubular acidosis namely Fanconi syndrome. Fanconi syndrome is often secondary to an underlying genetic disorder, among which Cystinosis and Lowe syndrome are commoner. There was neither the presence of clas-
sical features of cystinosis like fair skin, blond hair, impaired visual acuity, and hypothyroidism nor the typical presentation of cataracts suggestive of Lowe syndrome. Our child had not only presented with typical features of Fanconi syndrome, but also had early morning hypoglycaemia, massive hepatomegaly with glycogen laden hepatocytes all of which were pathognomonic of a glycogen storage disorder. Hence on setting the jumbled puzzle of this child’s multisystemic presentation with hypophosphatemic rickets, proximal renal tubular acidosis with glycogen storage disorder, our final diagnosis was Fanconi Bickel Syndrome.\(^{(3)}\)

Treatment of Fanconi Bickel is primarily symptomatic with replacement of water, phosphates, bicarbonate, and vitamin D; restriction of galactose intake; frequent small meals and early morning corn starch meals\(^{(3)}\). Our challenges did not stop only with the diagnosis but managing this child posed several problems. Ready-made oral phosphate supplements and corn starch meals which are the main stay of treatment are not available in India unlike in the West. We specifically prepared joulie’s solution in our biochemistry laboratory but it became increasingly difficult to procure raw materials. So we had to adopt a novel method of using the commercially available proctoclysis enema through oral route as our only source of phosphate supplementation. With the knowledge of mutations prenatal diagnosis can be offered to couples in subsequent pregnancies, using mutation analysis on chorionic villous sampling at 11 weeks of pregnancy. The defect in galactose metabolism can be picked up in the neonatal screening of metabolic disorders even before the actual metabolic effects of the disease unfold. The overall prognosis seems to be favorable and several patients have been reported to have reached adulthood in a stable condition\(^{(6)}\).

CONCLUSION

Any child presenting with hypophosphatemic rickets and proximal RTA, Fanconi Bickel Syndrome should be considered. Management strategies are still quite challenging in India. Clear Parental Counseling is key for child’s survival.

REFERENCES:


ACKNOWLEDGEMENT
Nil
The art of medicine consists of amusing the patient while nature cures the disease.

It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has.
AG U I L I N E S T O A U T H O R S

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