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Polycystic Ovary Syndrome (PCOS): Making Sense of the Alphabet

Lubna Pal

PCOS is the commonest endocrinopathy of reproductive years with a quoted prevalence of 5-11%, depending upon populations studied.1 Despite being a liberally diagnosed, the disorder remains relatively poorly understood. The syndrome was first described in 1935 as a conglomeration of symptoms of menstrual irregularity and signs of hyperandrogenism (hirsutism) and of enlarged cystic ovaries. Currently, at least three nomenclatures are widely recognized for diagnosing PCOS, with a considerable overlap in the diagnostic criteria (Table 1).2 It is imperative to appreciate the heterogeneity within the population diagnosed with PCOS and to recognize that PCOS remains a diagnosis of exclusion. The common systemic disorders that may mimic PCOS include hypothyroidism, hyperprolactinemia, late onset congenital adrenal hyperplasia, androgen secreting tumors, Cushing’s syndrome and exogenous androgen exposure; these must be excluded prior to arriving at a diagnosis of PCOS.1-2

Symptomatology of PCOS includes menstrual irregularity, and symptoms of relative androgen excess (excessive facial and body hair, acne and occasionally androgenic alopecia). Menstrual irregularity may be acknowledged by almost 2/3rd, mostly presenting as oligomenorrhea (duration of cycles>35 days), or even amenorrhea. Bothersome hair and/or acne may similarly be acknowledged in up to 2/3 of the patient population; androgenic alopecia is the least common of the symptoms, and can be seen in less than 10% of women meeting criteria for PCOS. The majority of the patients with PCOS are overweight (BMI=25 and <30 kg/m²) to obese (BMI=30kg/m²), although almost a third may be of a lean body habitus.

While the pathophysiology is far from understood, significant strides have been made in elucidating the endocrine and metabolic profiles in women diagnosed with PCOS.3 The endocrine profile of PCOS includes elevated serum levels of luteinizing hormone (LH). The hyperandrogenemia is commonly of ovarian origin (elevated testosterone) although elevations in serum levels of dehydroepiandrosterone sulfate (DHEAS) may additionally be seen identifying adrenal contributions to androgen excess in a subset. Mild elevations in prolactin may be observed in a proportion. Insulin resistance has emerged as a key player in the pathogenesis of the hypothalamo-pituitary dysfunction, and in the causation of hyperandrogenemia and hyperandrogenism.4

Management strategies must be individualized to the patient’s needs and risk profile. A recent review summarizes the spectrum of medical approaches to PCOS.5 Menstrual regulation is commonly achieved through use of combined hormonal contraceptive formulations (pills/patch or vaginal ring); this strategy offers endometrial protection as well as holds benefit against symptoms of androgen excess. The dose of estrogen (higher estrogen dose confers potential for benefit against hyperandrogenemia by increasing the hepatic production of sex hormone binding globulin that binds and reduces the circulating free androgen levels) and the type of progestin (anti androgenic progestins such as medroxyprogesterone offer potential for benefit whereas androgenic progestins such as levonorgestrel may worsen symptoms of acne for some) should be considered when deciding on the optimal hormonal contraceptive strategy. While oral contraceptive pills (OCP’s) are commonly utilized as a first line strategy in the management of PCOS, a potential for detriment relating to an injudicious use of this approach must be kept in perspective, given that deterioration in serum triglyceride profile is not uncommon.

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especially with the use of higher estrogen dose OCP’s. A risk for thrombo-embolic phenomenon must additionally be considered especially in the morbidly obese, and in those with existing hypertension. Insulin sensitizers, such as glugophage (metformin), offer a potential for improving reproductive physiology (menstrual regulation and improved androgen profile and symptoms of hyperandrogenism) in addition to their recognized metabolic benefits. Accrual data suggest that combining glugophage with hormonal approach may offer enhanced benefit than seen with the use of a single agent. Of interest are emerging data suggesting a promise of statins in improving the androgen profile in addition to the recognized facilitatory effects on lipids, and may offer a preferred strategy for those with significant dyslipidemia, especially in the setting of a strong family history of cardiovascular disease. Use of anti-androgens is of particular relevance for those with bothersome features of hyperandrogenism; adequacy of contraceptive coverage must however be ensured when prescribing anti-androgens, given their potential for teratogenicity. Topical therapies such as efomithine (for management of hirsutism) and minoxidil (for alopecia) are adjuncts that may offer targeted benefit. Limited data suggest a relevance of vitamin D deficiency in the pathophysiology of PCOS, ongoing studies may shed some light regarding potential for therapeutic efficacy of vitamin D in the management of PCOS.

To summarize, PCOS is a common disorder with a finite spectrum of manifestations; the diagnosis holds implications that extend well beyond the spectrum of presenting symptoms. Management strategies for PCOS should target not just the evident presenting complaint, but also the covert health burdens the individual patient is deemed at risk for. Beyond symptom control, management considerations must address endometrial protection, lifestyle modification to achieve target weight goals and risk reduction strategies to minimize future burden of cardiovascular risk and type II diabetes.

REFERENCES


The Association Between Oral Lichen Planus and HCV Infection

Javed A Qazi¹ and Abdul Haseeb Qazi²

ABSTRACT

Objective: The purpose of this study was to investigate the possible epidemiological relationship between Oral Lichen Planus (OLP) and Hepatitis C Virus (HCV) infection in Peshawar.

Methods: This case control study was conducted on three groups of patients who were investigated for HCV infection. Group I (78 Patients) clinically and histologically confirmed OLP were tested for HCV infection. Group II (78 Patients) control group seeking treatment for other mucosal lesions were screened for HCV infection. Group III (1809 patients) volunteers control group consisted of healthy persons who came to Khyber college of dentistry, Peshawar for dental treatment were also screened for HCV infection.

Results: In group I, 1(1.28 %) patients were found HCV positive with age range of 30-65 years. In group II, 2(2.86 %) patients were HCV positive while in group III, 56(3.09%) patients were HCV positive.

The weak association between OLP and HCV infection was seen in these patients. The result was not significant in the participants P>0.05.

Conclusion: This study suggested that no clear relationship could be established between OLP and HCV infection in Peshawar.

Key words: Oral Lichen Planus, Chronic hepatitis, Hepatitis C Virus infection.

INTRODUCTION

Lichen Planus is a chronic inflammatory mucocutaneous disease of squamous cell origin. The Oral Lichen Planus (OLP) is more common chronic recalcitrant than cutaneous type which may persist for more than 20 years without spontaneous remission.¹ It appears in 60-70% of the cases and affects 1-2% of the general population.²

Six clinical forms of OLP have been described but clinical classification describes three types of lesions; reticular, papular and plaque. They are also described as atrophic and erosive.

OLP may involve any site of oral mucosa. It usually appears bilaterally on the buccal mucosa, gingival and lateral borders of the tongue. It is associated with pre malignant risk and the transformation rate is 0.4-5.6 %.³

The exact etiology of OLP is unknown but may be due to a number of etiological factors such as stress, trauma, drugs (NSAID), Angiotensin converting enzymes inhibitors, dental materials such as amalgam and infectious agents (Herpes Virus, Herpes Virus 6, Cytomegalovirus, human papilloma virus, Epstein bar virus, H.pylori and Hepatitis viruses).¹

Hepatitis C Virus is an RNA virus and is the major cause of acute and chronic hepatitis. It is contracted chiefly through parenteral exposure to the infection with infected needles. The high risk patients of HCV infections are drug users, sharing needles, unsterilized dental instruments and health care workers.

The manner in which HCV infections predispose patients to development of Lichen Planus remains unclear but geographic localization may explain the different association and it is controversial since the incidence of coexistence of OLP and HCV viruses remarkably differ in different geographic regions.⁴

PATIENTS AND METHODS

This study was conducted in the Department of Oral Medicine/Pathology of Khyber College of Dentistry Peshawar from October 2009 to June 2011.

It was approved by College ethics committee. The inclusion criteria were clinically and histopathologically confirmed cases of OLP. The exclusion criteria were pregnant and lactating mothers and patients suffering from Chronic Hepatitis for the study and control groups.
The study sample consisted of 78 clinically and histopathologically confirmed OLP patients (69 women and 9 men), treated in the Department of Oral Medicine, Khyber college of Dentistry, Peshawar who were screened for HCV infection.

Two groups of patients served as control in this study. Group II included 78 patients (65 women and 13 men), the age and gender matched with other oral mucosal diseases treated in the Department of Oral Medicine such as oral Candidiasis, recurrent Aphthous stomatitis, pemphigus vulgaris, benign oral growth and hyperkeratosis.

The control group III consisted of 1809 patients who volunteered for HCV screening infection and were seeking routine dental treatment in this hospital.

Serologic Examination

The sera of all patients were screened for anti HCV antibodies by using ICT (Immunochromato graphic technique) method initially. As this method is not very valid technique so further confirmation was done by ELISA (Enzyme linked immunosorbent assay) and PCR was also done for quantitative result of HCV virus infection.

RESULTS

This study showed only one patient (1.28%) with OLP to have positive antibodies against HCV. This finding was lower than control groups where 2 patients in group II and 56 patients in group III (2.56%, 3.09%) were sero positive. There was no significant difference among the groups. Table 1.

The mean age range of the patients was 30-65 years. The duration of OLP was 7 days to 20 years. The incidence of Erosive Lichen Planus in this study was found to be 70% while Reticular lichen planus was 30%. A weak association between OLP and HCV was seen and results were not significant as P>0.05 which indicates that there is no linear relationship between OLP and HCV infection.

Table 1: HCV Sero positivity in different groups

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Cases</th>
<th>Sero Positive (Elisa and PCR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Study Group I</td>
<td>78</td>
<td>1</td>
</tr>
<tr>
<td>Control Group II</td>
<td>78</td>
<td>2</td>
</tr>
<tr>
<td>Control Group III</td>
<td>1809</td>
<td>56</td>
</tr>
</tbody>
</table>

DISCUSSION

OLP is a chronic inflammatory mucocutaneous disease of unknown etiology but there are many etiologic factors such as stress, immunologic disorders, genetics, systemic illness and HCV infection may play an important role in the pathogenesis of this disease. Hepatitis C Virus (HCV) infection is a major health problem in Pakistan. It is highly prevalent in subjects with chronic liver disease and strongly associated with hepatocellular carcinoma. It is presently considered the main etiologic agent of both blood borne and sporadic non A and non B hepatitis and one of the major causes of chronic liver disease worldwide. Its prevalence is 5% in general population in Pakistan.

Lichen Planus is one of the extra hepatic manifestations of HCV infection. The association between Lichen Planus and HCV infection is well documented but the mechanism remains perplexing.

The first case associating Lichen Planus and HCV was reported in 1991 and then 80 cases were reported worldwide which supported the link between Lichen Planus and HCV infection. However this association was still rare and controversial.

The epidemic variations confirm this association and occur in different regions of the World from 8.3% to 60%. However, there are other regions of the World where there is no difference in HCV infection rate between OLP patients and the common population.

In this study, we investigated the prevalence of HCV in 78 OLP patients and no association was found as compared to other studies in which there was an association between OLP and HCV infection.

Similarly, in Mediterranean regions where retrospective and prospective studies of British and Scandinavian OLP patients failed to show any correlation with the disease.

This study supports other studies conducted in Italy, Brazil and Netherlands which found no association between OLP and HCV infection.

Similarly the separate studies conducted in Spain, China and Iran proved that HCV had no etiological role for LP as in accordance with this study.

The prevalence of HCV infection in patients with Lichen Planus varies considerably from one geographic area to another as it was 4% in Northern France to 62% in Japan and had no association in Great Britain.

The geographic variations are mainly due to Human Leukocyte antigen (HLA) which plays a very important role as the expression of particular HLA alleles could be associated with susceptibility or resistance to the HCV infection.
The association between oral lichen planus and HCV infection

In conclusion, According to the results of our study, HCV infection has no etiologic role in OLP patients in Peshawar. It is recommended that further epidemiological investigations of laboratory tests should be carried out in future studies.

REFERENCES


Survey of Statistical Methods and Type of Articles Published in the Selected Pakistani Medical Journals from 1999 to 2007

Nazeer Khan¹ and Masood Hussain Rao²

ABSTRACT

Objective: To determine the frequency of type of articles and statistical methods used in 6 leading Pakistani medical journals of 1999 to 2007.

Methodology: All the original articles, case report, review articles and short communications published in 1999 to 2007 of those journals were reviewed. Total number of articles reviewed was 5001. The information recorded from these journals was: types of article; any statistical methods used and correctness of statistics.

Results: Out of 5001 articles reviewed, 1110 (22.2%) were case reports, 3395 (67.9%) were original articles, 213 (4.3%) were short communications, and 283 (5.7%) were review articles. The percentage of case reports was increased from 17.6% to 26.1%, while the percentage of original articles was reduced from 73.1% to 64.4%. Fifty nine percent of the original articles either did not contain any statistics or used only descriptive statistics. Seventy seven percent of the original articles have used appropriate statistics for making inferences.

Conclusion: There is a significant improvement in the use of statistics during the study period of 9 years. However with the introduction of systematic review, Chochran library and Meta Analysis, advanced techniques of biostatistics are needed to understand these types of articles.

Key words: Statistical methods, type of articles, medical journals, Pakistan.

INTRODUCTION

Statistical techniques are being used with increasing tendency in last few decades in all the medical journals. Furthermore, many authors are applying more complex statistics in their studies, sometimes with the help of statistical consultants. However, this rising trend and use of complex analyses are in contrast with relatively low knowledge of statistical concepts among medical faculty and average physicians, especially general practitioners.1-3 However, the recent developments, in the form of systematic review of Chochran library, meta analysis and evidence based medicine, are compelling the academicians, clinicians and researchers to understand statistical techniques, not only to incorporate it in their own research papers/work, but also to correctly translate the published literature into improved patients care.⁴

To determine the changes of application of statistics and type of analysis used in medical journals many surveys have been conducted in different countries, especially in western world.1,4-12 Few reviews are also conducted for the journals of developing countries.13-15 All those studies show that there are increasing tendency in the use of statistical methods.

More then 60 medical journals are being published from Pakistan. It would be an important and interesting exercise to evaluate the progress with respect to application of statistics, if any, in Pakistani medical journals. Therefore, this study was conducted to review the six Pakistani medical journals in the last nine years (1999 to 2007). The objectives of the study were to determine the frequency of type of articles published and statistical techniques used.

METHODOLOGY


First three are indexed in Pubmed (US National Library of Medicine) and the last three are the leading non-indexed Pakistani medical journals. All of them are
peer reviewed and have statistical consultants in their editorial/advisory boards. All the issues from 1999 to 2007 of these journals were reviewed. One of the authors (MHR) reviewed all the articles. JAMC and PAFMJ were publishing 2 issues per year until 1999 and 2004, respectively and are now publishing 4 issues annually. JCPSP and JPMA have published 12 issues in each year during the study period. Editorials, book review, and commentaries were not included in this survey. The information recorded from these journals was: types of article; any statistical methods used, types of statistics and p-value. Emerson and Colditz’s classification was used for statistical methods categorization. If more than one statistical techniques were employed in one article, all of them were recorded; however, if the same statistical method was repeatedly used in the same article, the method was recorded only once. To make the statistics simple and understandable, the nine years period was divided equally into three groups: 1999-2001, 2002-2004, and 2005-2007 and named as P1, P2 and P3, respectively. Chi-square test was employed to compare the differences of percentages. The significant level was fixed at 5%.

RESULTS

Five thousand and one (5001) articles were reviewed from 346 journals issues. The total number of publications was 1264 (25.3%) in P1 period and increased to 2022 (40.4%) in P3 period. JCPSP published the maximum numbers of 1743 (34.9%) articles. PJMS published 126 articles during P1 period, which was 10% of the total publications, and increased to 341 articles during P3 period which was 16.9% of all the articles during this period. The share of PJMR was reduced from 9.7% to 4.5% in P1 to P3 period. These changes of percentage was statistically significant (p<0.0001) (Figure 1). Out of 5001 total articles, 1110 articles (22.2%) were case reports, 3395 (67.9%) were original articles, 213 (4.3%) were short communications, and 283 (5.7%) were review articles. The percentage of ‘case reports’ was increased from 17.6% to 26.1%, while the percentage of ‘original articles’ was reduced from 73.1% to 64.4% from P1 to P3 period. This change of trend was statistically significant (p<0.0001) (Figure 2). JCPSP was the major contributor for this reverse trend, where the case reports were increased from 23.6% to 30.9%, while the original articles were reduced from 69.4% to 55.0% (Table 1). Since the statistics are applied mostly in original articles. Therefore, only the original articles were used for further analysis in this survey.

Table 2 depicts the statistical comparisons in the 3 study periods. Out of 3395 original articles reviewed, 924 (27.2%) were belonged to P1 period, 1168 (34.4%) were printed in P2 period and 1303 (38.4%) published in P3 period. Fifty nine percent of the original articles did not contain any statistics or used only descriptive statistics. There was significantly decreasing trend of 68.1% to 51% from period P1 to period P3 (P<0.0001). In P1 period 13.2% of the articles mentioned p-value for statistical inference, without mentioning the actual test of statistics, while this figure came down significantly to 7.4% in P3 period. Forty one percent of original articles have used some inferential statistics. This percentage increased significantly (p<0.0001) from 31.9% to 49% from P1 to P3 period. Seventy seven percent of the articles that have used some inferential statistics were appropriate. t-test (one-sample, two-samples independent and paired-wise) and contingency table tests (chi-square and related tests) were the most commonly used inferential techniques. These tests were used in 14.2% and 16.2% of original articles, respectively. The application of these tests were increased significantly from period P1 to P3 (p<0.0001). The use of non-parametric techniques was also increased significantly P1 to P3 (p = 0.003).

Table 3 depicts the cumulative percentages for minimum statistical methods used in the reviewed articles. The minimum statistical methods considered the fact that many articles used more than one statistical method. To understand this phenomenon, consider the first three items of P1 period: No statistical methods or descriptive statistics only, p-value without mentioning the test and t-test. Since the item ‘p-value without mentioning the test’ is disjoint with any other mentioned statistical test. Therefore the cumulative percentage of first 2 items will be 81.3% (68.1 + 13.2%), However, the articles that have used the third item t-test could also have used some other statistics. Therefore, 86.7% is less than the sum of three items (68.1 + 13.2 + 8.5), (see Table 3). The difference 5.4 (86.7 – 81.3)% is the number of articles that have used only ‘t-test’. The table indicates that the readers, who only knew descriptive statistics, could understand 68.1% of the articles in P1 period. However, in P3 period this percentage has been decreased significantly to 51% (p<0.0001). In P1 period the readers who had knowledge of only t-test and chi-square test could able to understand 92.7% of the articles. However, this percentage decreased significantly to 88.5% in P3 period (P<0.0001).
Table 1: Type of articles published in the selected journals from 1999 to 2007

<table>
<thead>
<tr>
<th>Journal</th>
<th>Type of the article</th>
<th>1999-2001</th>
<th>2002-2004</th>
<th>2005-2007</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
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<td>JAMC</td>
<td>Case Report</td>
<td>5 (3.5)</td>
<td>21 (10.7)</td>
<td>39 (14.3)</td>
<td>65 (10.6)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Original article</td>
<td>131 (91.6)</td>
<td>166 (84.3)</td>
<td>220 (80.9)</td>
<td>517 (84.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short Communication</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>7 (2.6)</td>
<td>7 (1.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review article</td>
<td>7 (4.9)</td>
<td>10 (5.1)</td>
<td>6 (2.2)</td>
<td>23 (3.8)</td>
<td></td>
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<td></td>
<td>Total</td>
<td>143 (23.4)</td>
<td>197 (32.2)</td>
<td>272 (44.4)</td>
<td>612 (12.2)</td>
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<td>JCPSP</td>
<td>Case Report</td>
<td>114 (23.6)</td>
<td>163 (26.9)</td>
<td>261 (39.9)</td>
<td>538 (30.9)</td>
<td>&lt;0.0001</td>
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<tr>
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<td>Original article</td>
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<td>374 (61.7)</td>
<td>360 (55.0)</td>
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<td>27 (5.6)</td>
<td>30 (5.0)</td>
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<td>69 (4.0)</td>
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<td></td>
<td>Total</td>
<td>483 (27.7)</td>
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<td>654 (37.5)</td>
<td>1743 (34.9)</td>
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<td>JPMA</td>
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<td>65 (22.6)</td>
<td>102 (22.6)</td>
<td>110 (24.1)</td>
<td>277 (23.2)</td>
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<td>298 (66.1)</td>
<td>260 (57.0)</td>
<td>741 (62.0)</td>
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<td>34 (7.5)</td>
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<td>25 (5.5)</td>
<td>52 (11.4)</td>
<td>91 (7.6)</td>
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<td>Total</td>
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<td>451 (37.7)</td>
<td>456 (38.2)</td>
<td>1195 (23.9)</td>
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<td>38 (24.7)</td>
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<td>116 (25.1)</td>
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<td>98 (63.6)</td>
<td>129 (62.3)</td>
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<td>3 (1.4)</td>
<td>3 (0.6)</td>
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<td>18 (11.7)</td>
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<td></td>
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<td>154 (33.3)</td>
<td>207 (44.7)</td>
<td>463 (9.3)</td>
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<td>PJMR</td>
<td>Case Report</td>
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<td>10 (7.9)</td>
<td>3 (3.3)</td>
<td>15 (4.4)</td>
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<tr>
<td></td>
<td>Original article</td>
<td>111 (91.0)</td>
<td>104 (81.9)</td>
<td>83 (90.2)</td>
<td>298 (87.4)</td>
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<td>4 (4.3)</td>
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<td>Review article</td>
<td>4 (3.3)</td>
<td>13 (10.2)</td>
<td>2 (2.2)</td>
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<td>Total</td>
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<td>127 (37.2)</td>
<td>92 (27.0)</td>
<td>341 (6.8)</td>
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</tr>
<tr>
<td>PJMS</td>
<td>Case Report</td>
<td>15 (11.9)</td>
<td>26 (14.4)</td>
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<td>99 (15.3)</td>
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<td>14 (7.8)</td>
<td>20 (5.9)</td>
<td>41 (6.3)</td>
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<td>12 (3.5)</td>
<td>34 (5.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>126 (19.5)</td>
<td>180 (27.8)</td>
<td>341 (52.7)</td>
<td>647 (12.9)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Case Report</td>
<td>223 (17.6)</td>
<td>360 (21.0)</td>
<td>527 (26.1)</td>
<td>1110 (22.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>Original article</td>
<td>924 (73.1)</td>
<td>1168 (68.1)</td>
<td>1303 (64.4)</td>
<td>3395 (67.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short Communication</td>
<td>45 (3.6)</td>
<td>79 (4.6)</td>
<td>89 (4.4)</td>
<td>213 (4.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review article</td>
<td>72 (5.7)</td>
<td>108 (6.3)</td>
<td>103 (5.1)</td>
<td>283 (5.7)</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>1264 (25.3)</td>
<td>1715 (34.3)</td>
<td>2022 (40.4)</td>
<td>5001 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

(%) = percentage

**DISCUSSION**

Literature indicates that there is noticeable increase in the use of statistics in health related journals. Furthermore, latest and more complex techniques are being employed to make the inferences about the studies. Many reasons have been documented for these changes, including: (i) researchers became conscious that analytical approaches to analyze their data have significant effect in publications; (ii) the request of editors and referees of the journals to include statistical analysis for the data; (iii) availability of menu-driven and friendly statistical soft-wares to the authors for easy computations of complex statistical techniques.
Statistical methods used in Pakistani medical journals

Table 2: Statistical methods applied in selected medical journals from 1999-2007

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No statistical methods or descriptive statistics only</td>
<td>629 (68.1)</td>
<td>723 (61.9)</td>
<td>665 (51.0)</td>
<td>2017 (59.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>P-value without mentioning the test</td>
<td>122 (13.2)</td>
<td>92 (7.9)</td>
<td>97 (7.4)</td>
<td>311 (9.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>t-test</td>
<td>79 (8.5)</td>
<td>162 (13.9)</td>
<td>240 (18.4)</td>
<td>481 (14.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Contingency tables</td>
<td>70 (7.6)</td>
<td>187 (16.0)</td>
<td>292 (22.4)</td>
<td>549 (16.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Analysis of Variance</td>
<td>10 (1.1)</td>
<td>36 (3.1)</td>
<td>60 (4.6)</td>
<td>106 (3.1)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>9 (1.0)</td>
<td>17 (1.5)</td>
<td>31 (2.5)</td>
<td>57 (1.7)</td>
<td>0.030</td>
</tr>
<tr>
<td>Epidemiological ratios</td>
<td>17 (1.8)</td>
<td>30 (2.6)</td>
<td>28 (2.1)</td>
<td>75 (2.2)</td>
<td>0.521</td>
</tr>
<tr>
<td>Simple linear regression</td>
<td>3 (0.3)</td>
<td>12 (1.0)</td>
<td>24 (1.8)</td>
<td>39 (1.1)</td>
<td>0.004</td>
</tr>
<tr>
<td>Multiple regression</td>
<td>9 (1.0)</td>
<td>12 (1.0)</td>
<td>22 (1.7)</td>
<td>43 (1.3)</td>
<td>0.221</td>
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<tr>
<td>Nonparametric statistics</td>
<td>9 (1.0)</td>
<td>15 (1.3)</td>
<td>35 (2.7)</td>
<td>59 (1.7)</td>
<td>0.003</td>
</tr>
<tr>
<td>Non-Parametric correlation*</td>
<td>4 (0.4)</td>
<td>5 (0.4)</td>
<td>3 (0.2)</td>
<td>12 (0.4)</td>
<td>0.634</td>
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<tr>
<td>Survival analysis</td>
<td>3 (0.3)</td>
<td>10 (0.9)</td>
<td>2 (0.2)</td>
<td>15 (0.4)</td>
<td>0.026</td>
</tr>
<tr>
<td>Other statistics</td>
<td>11 (1.2)</td>
<td>18 (1.6)</td>
<td>17 (1.3)</td>
<td>46 (1.4)</td>
<td>0.773</td>
</tr>
<tr>
<td>Statistics used</td>
<td>295 (31.9)</td>
<td>445 (38.1)</td>
<td>638 (49.0)</td>
<td>1378 (40.6)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Statistics appropriate</td>
<td>138 (81.7)</td>
<td>271 (78.1)</td>
<td>400 (75.6)</td>
<td>809 (77.4)</td>
<td>0.245</td>
</tr>
</tbody>
</table>

(%) = percentage

* Expected frequencies were less than 5 in 20% of the cells

Table 3: Statistical methods applied in selected medical journals from 1999-2007

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No statistical methods or descriptive statistics only</td>
<td>629 (68.1)</td>
<td>723 (61.9)</td>
<td>665 (51.0)</td>
<td>2017 (59.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>P-value without mentioning the test</td>
<td>751 (81.3)</td>
<td>815 (69.8)</td>
<td>762 (58.5)</td>
<td>2328 (68.6)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>t-test</td>
<td>801 (86.7)</td>
<td>892 (76.4)</td>
<td>869 (66.7)</td>
<td>2562 (75.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Contingency tables</td>
<td>857 (92.7)</td>
<td>1040(89.0)</td>
<td>1107(85.0)</td>
<td>3004 (88.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Analysis of Variance</td>
<td>867 (93.8)</td>
<td>1067(91.4)</td>
<td>1156(88.7)</td>
<td>3090(91.0)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>874 (94.6)</td>
<td>1084(92.8)</td>
<td>1185(90.9)</td>
<td>3143(92.6)</td>
<td>0.005</td>
</tr>
<tr>
<td>Epidemiological studies</td>
<td>890 (96.3)</td>
<td>1111(95.1)</td>
<td>1210(92.9)</td>
<td>3211(94.6)</td>
<td>0.001</td>
</tr>
<tr>
<td>Simple linear regression</td>
<td>893 (96.6)</td>
<td>1121(96.0)</td>
<td>1228(94.2)</td>
<td>3242(95.5)</td>
<td>0.017</td>
</tr>
<tr>
<td>Multiple regression</td>
<td>901 (97.5)</td>
<td>1130(96.7)</td>
<td>1250(95.9)</td>
<td>3281(96.7)</td>
<td>0.122</td>
</tr>
<tr>
<td>Nonparametric statistics</td>
<td>909 (98.4)</td>
<td>1145(98.0)</td>
<td>1283(98.5)</td>
<td>3337(98.3)</td>
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<tr>
<td>Non-Parametric correlation*</td>
<td>913 (98.8)</td>
<td>1150(98.5)</td>
<td>1286(98.7)</td>
<td>3349(98.6)</td>
<td>0.773</td>
</tr>
<tr>
<td>Survival analysis</td>
<td>913 (98.8)</td>
<td>1150(98.5)</td>
<td>1286(98.7)</td>
<td>3349(98.6)</td>
<td>0.773</td>
</tr>
<tr>
<td>Other statistics</td>
<td>924(100)</td>
<td>1168(100)</td>
<td>1303(100)</td>
<td>3395(100)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

for their data;16 and (iv) unintentional publication bias of accepting articles with statistical significant results, forcing the authors to use statistical methods, right or wrong, and get ‘p’ value lower than significant level.17-18

This study showed that there was almost 40% increase in the number of articles published during nine years period in those 6 journals. Many factors could be attributed for this notable increase. Many new medical colleges were opened and some public administered medical colleges were up graded to the university level in Pakistan. Consequently, there was intensification of medical faculty to teach in those institutions.

Furthermore, Higher Education Commission of Pakistan and Pakistan Medical and Dental Council are
Figure 1: Percentage of publication in three period-intervals

![Chart showing percentage of publication in three period-intervals for different journals.

Figure 2: Type of article in three period-interval

![Chart showing type of articles in three period-intervals for different types of articles: Case Report, Short Communication, Original Article, Review Article.

Demanding larger number of publications for promotion in academic ranking. These factors encouraged or forced the faculty members to publish more and consequently higher number of articles is being published in those journals. It should also be noted that there was an increasing tendency of publication of case reports. As it was mentioned before, teaching faculty was required to publish more for their promotions and case reports are easy to write and publish. Therefore, more case reports were published in place of original articles.

About sixty percent of the original articles, either did not use any statistics or only used descriptive statistics (mean, median, SD and percentage). This percentage is much higher than majority of previous reported studies. However, few studies showed almost the same result. The percentages of articles without any statistics were significantly decreased during the study period. Even though the presenting the p-value without specifying the test is still a problem, but has been significantly reduced from 13.2% to 7.4% during the study period. The studies on medical journals of China and Ethiopia also showed the same problem. The most common statistical tests used by the authors were t-test, and contingency table (Chi-square, Fisher Exact test, McNemar etc.). Most of the studies...
showed that these were the major test statistics applied in the biomedical journals. Analysis of variance, Epidemiological ratios (odd ratio, relative risk etc), correlation, simple and multiple regressions are also being used recently. However, the application of these statistical procedures is more common in other countries journals. The percentage of correct use of statistics was almost the same as in the studies of Kurichi & Sonnad and Wang & Zhang. However, it is lot more than reported appropriate percentage of Scales et al.11

This report shows that if a reader knows descriptive statistics, concept of p-value, t-test and test related to contingency table, he/she can understand 85% of biomedical articles in period P3. However, this percentage was 92.7 in period P1. Emerson and Colditz3 showed that the 73% of the readers who know these statistical concepts can understand ‘The New England Journal of Medicine’. Therefore, the knowledge of few basic statistics techniques; t and chi-square tests are still enough to understand about 85% of the articles of Pakistani medical journals. Nevertheless, with the introduction of systematic review, Cochran library and Meta analysis, advanced techniques of biostatistics are needed to understand these types of articles. Therefore, there is a need of teaching biostatistics in the education of doctors who wish to undertake research. The greater emphasis should be given to the statistics concerning dichotomous data (chi-square, logistic regression, odd ratio etc) along with methods concerned with continuous data, like multivariate regression, analysis of co-variance etc. As mentioned above the authors are forced some statistics in their articles due to publications (acceptance) bias and hence they do it whether it is right or wrong. However, due to shortage of medical statisticians, the appropriate statistics are not being used in the articles.

This study covered the articles of 6 leading Pakistani medical journals and showed the improvement took place in use of statistics. However, the results should be read with caution due to the top most positions of these journals among 62 medical journals published in Pakistan.

Acknowledgement: The authors are thankful to Dr. Abdul Wahid Usmani, Director Quality Enhancement cell, to review the article and Ms. Sundus Iftikhar and Ms. Sumaira Naz for data analysis and secretarial help.

REFERENCES
17 Sterling TD. Publications decisions and their possible effects on inferences drawn for tests of significance-or vice versa. J Am Stat Assoc 1959; 54:30-4.
ORIGINAL ARTICLE

Maternal and Perinatal Outcome of Hypertensive Disorders of Pregnancy at a Tertiary Care Hospital

Nazli Hossain,¹ Nusrat Shah,¹ Nazeer Khan,² Sunita Lata¹ and Nusrat H. Khan¹

ABSTRACT

Objective: To study the frequency of various hypertensive disorders of pregnancy and to determine their maternal and perinatal outcome.

Study Design: Retrospective descriptive study.

Place and Duration of Study: Department of Obstetrics & Gynecology Unit III, Civil Hospital Karachi, from January 2002 to December 2007.

Patients and Methods: A total of 626 cases were reviewed for age, parity, gestational age, diagnosis, antenatal and intra partum complications, mode of delivery and neonatal outcome. Data was analyzed using SPSS software (version 16).

Results: Total number of deliveries during the study period was 11,718 and there were 626 cases of hypertensive disorders of pregnancy giving a frequency of 5.34%. Pre-eclampsia was seen in 308 (49%), severe pre-eclampsia in 85 (13%), eclampsia in 121 (19.2%), chronic hypertension in 41(6%) and postpartum eclampsia in 21 (3.3%) patients. There were 39 maternal deaths (case fatality rate: 6.23%). The mean ages for pre-eclampsia, severe pre-eclampsia, eclampsia and chronic hypertension were 28, 27, 24 and 29 (27 years) years respectively. The commonest maternal complication of hypertensive disorders was postpartum hemorrhage in 24 women (42%). This was followed by placental abruption in 9 women (1.6%) and pulmonary edema in 8 women (1.4). The prevalence of prematurity in pre-eclampsia, severe pre-eclampsia and eclampsia in study population was 14%, 5% and 8.6% respectively. Cesarean section was required for pre-eclampsia, severe pre-eclampsia and eclampsia in 46%, 51% and 61% of patients respectively. The main fetal complications were found to be still birth (14% in pre-eclampsia, 18% in severe pre-eclampsia and 15% in eclampsia) and low birth weight (31% in pre-eclampsia, 49% in severe pre-eclampsia and 52% in eclampsia). Conclusion: Hypertensive disorders in pregnancy are an important cause of maternal and perinatal mortality and morbidity.

Key words: Pre eclampsia, eclampsia, maternal mortality.

INTRODUCTION

Hypertensive disorders of pregnancy are reported in 6-8% of pregnancies.¹ Globally it is a major cause of maternal mortality.²–³ Studies from Pakistan rank it among the top three most common causes of maternal deaths.⁴–⁵ The frequency of hypertensive disorders of pregnancy was reported as 15% in one study from Pakistan.⁶ Hypertension during pregnancy also affects the fetal outcome. It is associated with Prematurity, intrauterine demise, low birth weight and increased risk of admission to neonatal intensive care unit. In a hospital based study from Karachi, it was found to be the leading cause of stillbirth.⁶ The case fatality from hypertension during pregnancy is far higher in developing world, when compared to the developed world.⁷

The etiology of hypertensive disorders of pregnancy is still elusive. A number of risk factors have been identified including maternal age, obesity, increased inter-pregnancy interval, family history of hypertension in mother, twin gestation, underlying vascular disorders like diabetes mellitus, bacterial and viral infections and antiphospholipid syndrome.

Both maternal and perinatal morbidity is also increased in hypertensive disease of pregnancy. Maternal complications include placental abruption, postpartum hemorrhage, intracranial hemorrhage and pulmonary edema. Perinatal morbidity is mainly attributed to low birth weight, prematurity and intrauterine growth restriction.

The recurrence of disease in subsequent pregnancy calls for prophylaxis. The role of low dose aspirin in subsequent pregnancy in women with past history of eclampsia is well established.⁸ Researchers are now
investigating the role of low molecular weight heparin in women with history of severe preeclampsia without any thrombophilia. 9-10 Non invasive methods include use of uterine artery Doppler in first and second trimester to predict pre-eclampsia at earlier stages. 11

We conducted this study to determine the frequency of various hypertensive disorders of pregnancy and their maternal and perinatal outcome, since, hypertensive disorders are among the first three most common causes of maternal mortality in Pakistan.

PATIENTS & METHODS

A retrospective cross-sectional study was conducted by reviewing the medical records of all women admitted with hypertensive disorders of pregnancy in the department of Obstetrics & Gynecology Unit 3, Civil Hospital Karachi & Dow University of Health Sciences, from January 2002 to December 2007. During the study period a total of 11,718 deliveries were conducted and 626 women were identified as having hypertensive disorders of pregnancy. Of these, complete medical records were available for 576 women whose data were entered into SPSS computer software program and was analyzed.

Hypertensive disorders of pregnancy were classified as Pre-eclampsia (PE), Severe Pre-eclampsia (SPE), Eclampsia and Chronic Hypertension. This classification was done, according to National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. 1 Pre-eclampsia is defined as new onset hypertension (systolic = 140mm Hg, and diastolic blood pressure of = 90mm hg) after 20 weeks of gestation along with proteinuria (> 300mg/dl in 24 hours). Severe Pre eclampsia is defined as blood pressure = 160/110 mm Hg with proteinuria of 2gm/dl, along with clinical features of severe headache, blurring of vision, epigastric pain and oligura.

Eclampsia is defined as generalized convulsions, in a woman with SPE in the absence of any other cause. Women who were known to be hypertensive, before pregnancy, were grouped as having chronic hypertension. In final analysis, we also included women who were brought to the unit after delivery with fits. Care was taken to exclude other causes of fits like hypoglycemia, malaria and hypocalcaemia. Thus in total we had five groups: Pre-eclampsia, severe pre-eclampsia, eclampsia, chronic hypertension and postpartum eclampsia. Majority of these women were not booked at the hospital. The departmental protocol consists of routine use of magnesium sulphate for women with eclamptic seizures, which is continued for 24 hours after the last fit. For acute control of blood pressure, hydralazine and oral nifedipine are used.

Blood samples are collected for complete blood picture, random blood sugar and liver and renal function test. Urine for albumin and 24 hour urinary protein are done routinely. Coagulation profile is carried out in event of low platelet count. Maternal complications like HELLP syndrome (hemolysis, elevated liver enzymes and low platelet count), renal failure, placental abruption, postpartum hemorrhage, neurological complications and pulmonary edema were noted.

Fetal outcome included gestational age, birth weight, Apgar score, intrapartum demise or early neonatal death. Intrapartum details were also recorded. Demographic data included age, parity, history of hypertension in previous pregnancies and recurrent disease.

STATISTICAL ANALYSIS

The data were analyzed using SPSS (Version 16.0). Mean values of hemoglobin, total leucocyte count (TLC), platelet (PLT), Serum Creatinine, maternal age, gestational age and fetal weight of the five groups were compared using one- way ANOVA. Turkey HSD post HOC test was employed for significant value obtained by ANOVA for multiple comparisons. Frequency of maternal complications with hypertensive disorders was also computed.

RESULTS

A total of 11,718 deliveries were conducted during the study period and 626 women were admitted with the diagnosis of hypertensive disorders of pregnancy, giving a frequency of 5.34%. Pre-eclampsia was diagnosed in 309 women, SPE in 85, eclampsia in 122, post-partum eclampsia in 20 and CH in 41 women. Thirty-nine mothers died (case fatality rate: 6.23%). Table 1 shows the demographic and clinical data of these women, who have been divided into five groups. Maternal age was highest in women with chronic hypertension, and lowest in women with eclampsia. Serum urea was also highest in women with chronic hypertension. Women with eclampsia also had higher total leukocyte counts where as platelet count did not show any association with disease severity. Gestational age was also low in women with eclampsia and chronic hypertension. Women with eclampsia had lower gestational ages and fetal birth weights (p-value < 0.001).

Cesarean section was required for PE, SPE and eclampsia in 46%, 51% and 61% of patients respectively. Uncontrolled blood pressure was the main indication for Cesarean section in all the three groups of women.

The commonest maternal complication was postpartum hemorrhage in 24 women (4.2%). This was followed by placental abruption in 9 women (1.6%) and pulmonary edema in 8 women (1.4%). These
Table 1 showing demographic and clinical variables of women with hypertensive disorder of pregnancy

<table>
<thead>
<tr>
<th></th>
<th>Pre eclampsia</th>
<th>Severe Preeclampsia</th>
<th>Eclampsia</th>
<th>Postpartum eclampsia</th>
<th>Chronic hypertension</th>
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<tbody>
<tr>
<td></td>
<td>N= 308</td>
<td>N=85</td>
<td>N = 122</td>
<td>N= 20</td>
<td>N=41</td>
</tr>
<tr>
<td></td>
<td>X ±SD [significance]</td>
<td>X ±SD [significance]</td>
<td>X ±SD [significance]</td>
<td>X ±SD [significance]</td>
<td>X ±SD [significance]</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>9.32±1.56</td>
<td>9.74±1.80</td>
<td>9.43±2.07</td>
<td>9.79±1.68</td>
<td>9.63±1.60</td>
</tr>
<tr>
<td>TLC</td>
<td>8894±7226</td>
<td>8840±4245</td>
<td>11926±9821</td>
<td>10794±4807</td>
<td>9269±5062</td>
</tr>
<tr>
<td>PLT</td>
<td>282±1525</td>
<td>574±3118</td>
<td>189±97.41</td>
<td>194±106</td>
<td>204±113</td>
</tr>
<tr>
<td>Serum Urea</td>
<td>21.80±10.57</td>
<td>25.34±17.57</td>
<td>24.01±12.85</td>
<td>30.39±16.27</td>
<td>35.85±5.44</td>
</tr>
<tr>
<td>Serum Creatinine</td>
<td>.769± .483</td>
<td>.787±.493</td>
<td>1.016±.737</td>
<td>1.200±1.691</td>
<td>1.021±.937</td>
</tr>
<tr>
<td>Maternal age</td>
<td>27±5.37</td>
<td>28±5.07</td>
<td>24±5.05</td>
<td>26±7.29</td>
<td>29±6.34</td>
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<tr>
<td>Gestational age</td>
<td>36±2.84</td>
<td>35±2.60</td>
<td>34±3.67</td>
<td>36±2.012</td>
<td>34±3.66</td>
</tr>
<tr>
<td>Fetal weight in grams</td>
<td>2774±837</td>
<td>2476±957</td>
<td>2345±852</td>
<td>2790±242</td>
<td>2634±900</td>
</tr>
</tbody>
</table>

* Different alphabets indicate statistical significance

Table 2 showing maternal complications in women with hypertensive disorders of pregnancy

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abruptio placenta</td>
<td>9 (1.6%)</td>
</tr>
<tr>
<td>HELLP syndrome</td>
<td>4 (0.7%)</td>
</tr>
<tr>
<td>Renal failure</td>
<td>5 (0.9%)</td>
</tr>
<tr>
<td>DIC</td>
<td>7 (1.2%)</td>
</tr>
<tr>
<td>Pulmonary edema</td>
<td>8 (1.4%)</td>
</tr>
<tr>
<td>Intracranial hemorrhage</td>
<td>4 (0.7%)</td>
</tr>
<tr>
<td>PPH</td>
<td>24 (4.2%)</td>
</tr>
<tr>
<td>Maternal death</td>
<td>5 (0.9%)</td>
</tr>
</tbody>
</table>

complications were more commonly seen in eclamptic women. Among eclamptic women, 39% had had more than three fits before admission to hospital. The complication of intracranial hemorrhage was seen only in women with eclampsia. The maternal complication of intracranial hemorrhage was most frequent in women who had > 3 fits before admission.

Still birth was the main fetal complication in all the groups, PE: 14%, SPE: 18%, eclampsia: 15%. There were a total of 110 perinatal deaths among the study population, giving a perinatal mortality rate of 175 per 1000 Total births. Low birth weight (<2.5 kg) was also a significant finding in our study and was most frequently seen in women with eclampsia (52%).

DISCUSSION

Hypertensive disorders occur in 6-8% of the pregnancies. This rate varies among different populations. Pre eclampsia is seen in 3-14% of all pregnancies. Prevalence of eclampsia was found to be 3.2% in a hospital based study from Pakistan.

The prevalence of chronic hypertensive diseases complicating pregnancy is 3%. In our study, the frequency of hypertensive disease during pregnancy was around 5.34%. The difference in prevalence of disease in different populations has been attributed to race, ethnicity, geographical location, parity and to numerous other factors.

Severe pre-eclampsia and eclampsia are commonly seen in young, nulliparous women, belonging to low socio economic class, with little or no access to antenatal facility. This picture was also seen in our study. Women, who were classified as having eclampsia, had a mean age of 24 ± 5.05 years (p < 0.001). Similarly women with chronic hypertension had a mean age of 29 years, which was also found significant. Laboratory data also showed significant association of eclampsia with a higher leukocyte count (p = 0.004). Infection has been associated with increased risk of PE. Both bacterial and viral infections have been shown to increase the
risk of PE two folds.\textsuperscript{15-16} Platelet counts were not found to have a significant association with disease severity in this study.

Hypertensive disease in pregnancy has been associated with increased risk of maternal mortality. Moodley reported 18\% of maternal deaths in South-Africa in the year 2002-04, due to hypertensive diseases of pregnancy.\textsuperscript{3} Similarly 19\% of maternal deaths in USA in the year were attributed to hypertension during pregnancy.\textsuperscript{2} A national survey, looking at direct causes of maternal mortality, found eclampsia as the third leading cause of maternal death, preceded by hemorrhage and sepsis.\textsuperscript{4} In our own hospital based study of maternal deaths over a period of 3 years, hypertensive disorders were responsible for 15\% of maternal deaths, second commonest cause of maternal death.\textsuperscript{5} Intracranial hemorrhage is the leading cause of death in hypertensive disease of pregnancy.

We had 39 maternal deaths in our study majority of which occurred in eclamptic women. Rigorous control of blood pressure along with magnesium sulphate has been recommended to decrease the incidence of maternal death due to eclampsia. The frequency of eclampsia in the above study was 21\%. The prevalence of postpartum eclampsia in our study was 3.6\%. The reported prevalence of eclampsia in antepartum period is 38-55\% where as in intrapartum period it is 13-36\%. Late postpartum convulsions, after 48 hours but within 6 weeks may be seen in 5-17\%.\textsuperscript{17} The prevalence of eclampsia has been found to be much greater in developing countries as compared to developed countries (6-100 cases versus 4-6 cases /10,000 live births).\textsuperscript{17}

Perinatal complications of hypertensive diseases in pregnancy include premature delivery, oligohydramnios, intrauterine death due to asphyxia, low birth weight and poor Apgar scores at birth. The cumulative stillbirth rate in our study was 175 /1000 live births. Stillbirths were highest in women with SPE (18\%). Similarly hypertension during pregnancy was identified as a leading cause of stillbirths in a hospital based audit of stillbirth from a large tertiary referral center.\textsuperscript{16} Increased perinatal mortality rate is also attributed to preterm gestation. In our study, women who were diagnosed with eclampsia had a mean gestational age of 34 weeks, which was found significant when compared to other subgroups.

The rate of obstetric intervention has been found to be high in hypertensive disorders of pregnancy.\textsuperscript{18} In our study, Cesarean section was the main mode of delivery, with highest rate observed for eclampsia (52\%). The main indications for operative intervention were uncontrolled blood pressure and fetal distress.

There is a risk of recurrent eclampsia in subsequent pregnancy. The reported risk in literature is around 25-65\%.\textsuperscript{19} Recurrence risk is dependant upon the severity of disease and gestational age. Women having severe preeclampsia at an earlier gestational age are more prone to recurrent disease. The recurrence risk persists even after normal deliveries in between. In our study population, recurrent hypertensive disease was seen in 19\%. This emphasizes the role of prophylactic low dose anti-platelet therapy in subsequent pregnancies. The role of anticoagulant therapy in this group of women is also being explored. Rey et al, in a pilot study of women with a past history of severe pre eclampsia, intrauterine demise and other placental mediated complications without thrombophilia, randomized women in two groups. (Low molecular weight heparin versus no treatment). Among the 110 women included in the final analysis, dalteparin was associated with a lower rate of the primary outcome [5.5\% (3/55) vs. 23.6\% (13/55), adjusted odds ratio (OR) = 0.15, 95\% confidence interval (CI) 0.03-0.70]\textsuperscript{9}

Recently, the cardiovascular risk in women having hypertensive disease of pregnancy has been highlighted in the literature. Women with PE in pregnancy were found to have higher incidence of dyslipidemia, hypertension and increased insulin resistance in later life.\textsuperscript{20} The risk has been found to be greater in those women who develop both maternal (hypertension and proteinuria) and fetal complications (intrauterine growth restriction).\textsuperscript{21} At the time of discharge from hospital, these women should be counseled for a change in lifestyle and the importance of medical follow up in later years of life.

CONCLUSION

We can conclude from this study that hypertensive disorders of pregnancy are a significant cause of maternal and perinatal mortality and morbidity in our institution.

REFERENCES


ORIGINAL ARTICLE

Prevalence of Elevated Luteinizing Hormone (LH)/Follicle Stimulating Hormone (FSH) Ratio in Polycystic Ovary Syndrome (PCOS) Women Among Local Population

Shehla Haider, 1 Nighat Manan, 1 Ayesha Khan2 and Masood A Qureshi 1

ABSTRACT

Objective: To assess the frequency of elevated LH/FSH ratio >1 in women with polycystic ovary syndrome among local population.

Study Design: Cross-sectional study.

Methodology: This cross-sectional study was carried out at two tertiary care hospitals in Karachi during October 2010 to Feb 2011. A total of 163 PCOS women of reproductive age (18-40 years) fulfilling revised Rotterdam 2003 criteria were studied. The data recorded on a prescribed proforma include current age, age at menarche, menstrual irregularities, presence of hirsuitism, acne, infertility, familial nature, blood pressure, BMI, waist to hip ratio. Blood sample for gonadotropin assay were taken in random state on specific dates of menstrual cycle (day 6th to day 30th) in gel tube. Hormonal assay were performed using chemiluminescent immunoassay.

Results: Mean age of presentation of PCOS subjects was 24.88±5.35 years. Menstrual irregularities (99%) were the commonest presentation followed by acne (88%), hirsuitism (71%) and infertility (62%). A high frequency (>71%) of elevated LH/FSH >1 ratio was observed among local population.

Conclusion: The present study concludes that elevated LH/FSH ratio >1 is a characteristic finding of Pakistani population of PCOS (present in = 71% of patients) and with proper sampling dates can be used as diagnostic tool for establishing the diagnosis of PCOS.

Key words: PCOS; gonadotropin, BMI.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a common endocrinopathy of childbearing bearing age women with an estimated prevalence of 4-12 %. 1-3 It is one of the leading causes of infertility in females. 4 The features of PCOS are heterogeneous and vary with age ranging from premature puberty in childhood, menstrual cycle disturbances, obesity, acne, hirsuitism and infertility in early adulthood and middle life to type II diabetes, cardiovascular diseases and malignancies later in life. However, usually patients present with classical description of menstrual irregularities, hyperandrogenism, central obesity and typical ultrasonographic findings around the time of menarche.5-6

In recent years health care professionals have begun to consider PCOS as a life time disorder with significant long term health risks. 7 These risks includes insulin resistance, type II diabetes, dyslipidemia, cardiovascular diseases and even malignancies like cancer of endometrium. 8-9 Furthermore the typical phenotypic expression of the disease makes PCOS women particularly in adolescent age group more vulneranable to emotional stress.10 Therefore, it seems very important to have an early and accurate diagnosis of the disease since early diagnosis and intervention can prevent or at least delay many of these maladies later in life. Even in most developed countries like USA the PCOS and its related complications are a huge economic burden (approximately $4.37 billion annually). 11 Pakistan being a poor country with limited resources cannot bear such great losses.

Elevated LH/FSH ratio is typically seen in PCOS patients 12 and was also considered as a gold standard for clinical diagnosis of the disease during early 90’s 13 however became controversial by a number of studies which reported a variable prevalence (30-90%) among PCOS women. 14-16 Even Rotterdam 2003 diagnostic criteria for PCOS, presently the most acceptable one, do not include it. 17 All such studies were done on blood
samples taken during the “early follicular phase” (Day 1-3) of menstrual cycle, when serum LH is normally suppressed and therefore may lead to under estimation of elevated LH/FSH ratio.

PATIENTS AND METHODS
This cross-sectional study was carried out at IBMS, DUHS Karachi in collaboration with Gynae/infertility clinics of two tertiary care hospitals in Karachi; Civil Hospital and Lady Dufferin Hospital. The research proposal was approved from Ethical Review Board of Dow University of Health Sciences and all subjects were enrolled voluntarily in the study after being explained by concerned doctor and signing the consent form. A total of 163 PCOS women of childbearing age (18-40 years) fulfilling revised Rotterdam 2003 criteria were studied during the period from October 2010 to February 2011.

PCOS women who were pregnant, or on any contraceptive pills or oral hypoglycemic agents were excluded from the study. Also ammenorrhic PCOS women were excluded from the study. A detail history was taken on a pre-structured proforma which includes current age, age at menarche, history of menstrual irregularity, acne, hirsuitism, infertility, obstetric history, occurrence of similar cases in family. Complete physical examination including height, weight, body mass index (BMI) and Waist to Hip ratio, blood pressure was also recorded. For assessing the level of obesity, we used new Asian BMI classification.

For estimation of serum LH and FSH blood samples (5ml) were drawn in follicular phase of menstrual cycle (from 6th day of menstruation till 30th day) by venepuncture in random state. Whole blood was collected in SST gel clot activator tube. Serum was separated after a standardized time and subjected to chemiluminescent immunoassay for gonadotropin (LH/FSH). Statistical analysis were performed using the Statistical Package for the Social Sciences version 16.

RESULTS
Table-1 describe the demographic, clinical and hormonal characteristics of Pakistani population PCOS. Menstrual irregularities were the commonest presentation (99%) followed by acne (88.8%) Hirsuitism (71.9%), and infertility (62.5%). Frequency of obesity in our studied population was 69%.

DISCUSSION
Polycystic ovary syndrome is a disease of public health importance as it is related with a number of long term significant health risks. The exact prevalence of PCOS in Pakistan is not known but in the neighboring countries like Sri-Lanka and India the burden of disease is as high as 6.3% and 9% respectively.18-19 So a comprehensive approach to the evaluation and treatment of affected women is required.20

This study was an attempt to explore the role of LH/FSH ratio as an indicator for PCOS at an early stage of investigation. This will be beneficial to both patients as well as physician for the better management of disease. LH/FSH ratio is a ratio between two gonadotropin hormones; LH and FSH. These two hormones are secreted by the β-cells of the anterior pituitary under the influence of the hypothalamic GnRH. In females, LH act on the theca cells of the ovary to cause androgen production from cholesterol, while FSH regulates function of granulose cells that causes the conversion of the cally derived androgens to estrogens by aromatase enzyme.21 A delicate balance of LH and FSH is required for early follicular development. In normal females LH/FSH ratio in early follicular phase is normally 1. If LH levels are too high, theca cells produced large amount of androgens causing follicular atresia. Both the absolute level of circulating LH as well as its ratio to FSH is significantly elevated in PCOS women.22 The increase in intraovarian androgens believed to play a significant role in anovulatory process. When any anovulatory state exists for a period of time affected women developed bilaterally enlarged polycystic ovaries – a hallmark of PCOS patient and a finding present in more than 80% of PCOS.

Abnormal gonadotropin secretion has been implicated in pathogenesis of PCOS and is very typical finding among such patients. However their role in identification of PCOS remains controversial. The international data showed a variable prevalence of 30-90% among PCOS women. In the recent years more stress has been paid to the day of menstrual cycle chosen for gonadotropin sampling as one of the possible reason for under estimation of elevated LH/FSH ratio and hence its controversial role in identification of PCOS. This seems quite logical as it is well recognized in literature that serum LH level is strongly correlated with days from natural or induced menses. Both exogenous progesterone (commonly prescribed to PCOS women for induction of withdrawal bleeding) and endogenous progesterone (associated with spontaneous ovulation) decreases serum LH secretion.22,23 This suppressive effect of progesterone is sustained even in early phase of next menstrual cycle.23 Routinely measurement of serum LH and LH/FSH ratio are being done in early follicular phase of menstrual cycle i.e. day 1-3,17 when it is normally suppressed and therefore prevalence of elevated LH/FSH ratio is under estimated. and hence produce limited role in diagnosis of PCOS.

In the present study blood samples for gonadotropin were taken on specific days of menstrual cycle (from day 6th to day 30th) and the study results showed a high
Prevalence of elevated LH/FSH ratio in PCOS women among local population

Table 1: Descriptive Statistics of Study variables (n=163)

<table>
<thead>
<tr>
<th>Demographic profile</th>
<th>n</th>
<th>Mean ± SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>163</td>
<td>24.88 ± 5.35</td>
<td>18</td>
<td>40</td>
</tr>
<tr>
<td>Height (m)</td>
<td>163</td>
<td>1.56 ± 0.05</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>163</td>
<td>66.14 ± 11.02</td>
<td>48</td>
<td>121</td>
</tr>
<tr>
<td>BMI(Kg/m²)</td>
<td>163</td>
<td>27.03 ± 4.42</td>
<td>20.2</td>
<td>44.44</td>
</tr>
<tr>
<td>Hip circumference(cms)</td>
<td>163</td>
<td>107.10 ± 9.16</td>
<td>86</td>
<td>139</td>
</tr>
<tr>
<td>Waist circumference (cms)</td>
<td>163</td>
<td>96.15 ± 10.58</td>
<td>72</td>
<td>124</td>
</tr>
<tr>
<td>Waist-hip ratio</td>
<td>163</td>
<td>0.89 ± 0.05</td>
<td>0.75</td>
<td>0.98</td>
</tr>
</tbody>
</table>

**Clinical profile**

Systolic blood pressure(mmHg) 163 106.93 ± 8.91 90 130
Diastolic Blood Pressure (mmHg) 163 67.98 ± 7.64 60 90

**Hormonal profile**

Serum LH(mIU/ml) 163 9.39 ± 7.08 1.15 54.2
Serum FSH(mIU/ml) 163 5.96 ± 2.84 1.51 18.5
LH-FSH ratio 163 1.72 ± 1.15 0.24 6.14

Table 2: Body Mass Index (Kg/m2) of PCOS patients (n=163)

<table>
<thead>
<tr>
<th>BMI</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (18.5-22.9)</td>
<td>18</td>
<td>11.3</td>
</tr>
<tr>
<td>Overweight (23-24.9)</td>
<td>32</td>
<td>19.4</td>
</tr>
<tr>
<td>Obese I (25-29.9)</td>
<td>91</td>
<td>55.6</td>
</tr>
<tr>
<td>Obese II (= 30)</td>
<td>22</td>
<td>13.8</td>
</tr>
</tbody>
</table>

LH/FSH RATIO IN WOMEN WITH POLYCYSTIC OVARY SYNDROME n=163

A high prevalence of elevated LH/FSH>1 ratio was observed in present studied population of PCOS

frequency (71%) of elevated LH/FSH ratio >1 among Pakistani population of PCOS. This high frequency of elevated LH/FSH ratio is quite significant as it points towards its potential role in diagnosis of PCOS.

This study results are consistent with finding of Iwasa et al. in which they evaluated LH/FSH ratio in both in early and late follicular phase of PCOS women and found that in late follicular phase the prevalence of elevated LH/FSH ratio was much high (89%) as compare to early follicular phase when it is only elevated in 52% of patients only. Therefore they also recommended late follicular sampling.23

These results are also consistent with findings of Hsu et al. (2009) in which they evaluated 251 PCOS women in specific days of menstrual cycle and found that 70% of such women have elevated LH/FSH ratio >1. Therefore they also concluded that the LH-FSH ratio is a valuable diagnostic tool in evaluating women with PCOS and an LH-FSH ratio of >1 may be used as a decision threshold.24

These results are also in accordance with the findings of Hendrick et al. who did a study on PCOS women and also concluded gonadotropin assays should not be done during early follicular phase (day 1-5) as it is normally suppressed during this phase.25

LH/FSH ratio seems to be a better choice to be assessed as an indicator of disease in comparison with other two parameters ultrasound and serum testosterone. Currently transvaginal u/s is considered to be the gold standard for PCOS diagnosis26 but this is not suitable for unmarried girls especially in our culture.

As far as serum testosterone levels are concerned a number of physiological factors influence serum testosterone level like its pulsatile release during the day,27 diurnal rhythm (am > pm)28, its relation with phases of menstrual cycle (luteal > follicular)29 and age in years (20 s -40 s).30

CONCLUSION
The present study concludes that elevated LH/FSH ratio>1 is a characteristic finding of Pakistani population of PCOS (present in = 71% of patients) and with proper sampling dates can be used as diagnostic tool for establishing the diagnosis of PCOS.

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12 Taylor AE. Gonadotropin dysfunction in women with polycystic ovary syndrome. Fertil Steril 2006; 86:12.
Factors Associated with Cessation of Breast Feeding
Shaheena Hanif, Ghulam Murtaza and Muhammad Hanif Memon

ABSTRACT

Objective: To determine factors associated with cessation of breast feeding in children.
Methodology: This was a cross sectional study carried out at Lyari general hospital from 1st January to 30th June 2009. Children up to two years of age were included. Information entered in a pre-designed proforma.
Results: Total of 543 children included. Maternal factors were insufficient milk secretion 57% and insufficient rest during first six weeks of post partum 43%. Among factors in children, formula feeding 41% and disruption during feeding 36% were common. No enough milk during first few days after birth 64% and baby remains hungry after breast feeding for enough time 62% were common myths.
Conclusion: The major maternal and child factors and myths responsible for termination of breast feeding were insufficient milk secretion, breast problems, maternal stress, bottle feeding and initial breast milk is harmful to the babies. These misconception must be addressed during antenatal visit.

Key words: Cessation breast feeding, maternal factor, infant factor, myths.

INTRODUCTION

Human breast milk is the best source of nourishment for human infant and it helps in preventing disease, promoting health and reducing feeding cost. It also prevents allergic and infectious diseases by giving necessary immunological protection. In both developing and developed countries artificial feeding is associated with more deaths from diarrhea in infancy. WHO recommends exclusive breast feeding for the first six months of life and then breast feeding up to two years or more. Exclusive breast feeding for first six months of life provides protection against diarrhea and respiratory tract infection which are common in babies who fed supplementary milk. Although a majority of mothers start breast feeding at birth, a large percentage discontinue during early months. In developing countries like Pakistan and India exclusive breast feeding is only 37%, and 46% respectively where as in developed countries like China it is 51%. Several factors are associated with cessation of breast feeding like twins, low birth weight baby, prematurity, interruption during feeding, long separation from mother, difficulty in latching on to the breast, poor stamina of mother, severe maternal psychological stress and insufficient rest of mother during first six weeks postpartum. There are a lot of practices in our society which interfere with early initiation of breast feeding like various pre-lacteal feeds, mother’s milk is not enough during first few days after birth, mother should stop breast feeding if she get pregnant and breast feeding is not possible after cesarean delivery. The rationale of this study is to find out the factors in our society which result in cessation of breast feeding.

METHODOLOGY

This was a cross sectional study carried out at OPD of pediatric department of Lyari general hospital, Dow Medical College, Dow University of health sciences from January 2009 to June 2009. Majority of patients came in OPD belonged to Lyari town.

All children up to two years who attended the OPD for vaccination and minor ailment were included after taking verbal consent. Children who received breast feed, formula feed or both breast and formula, were included in the study. Children who needed hospitalization, congenital anomalies, neuromuscular disorders, children of non co-operative mothers, children accompanying by other than mother and adopted child were not included in study. Pre-designed proforma which included age of child, age of mother, parity, mode of delivery, educational status of mother and maternal and child factors presumably interfere with breast feeding like insufficient milk secretion, breast engorgement, poor stamina, insufficient rest during first six weeks postpartum, working women with early...
return to work, cesarean section, formula feeding, twins, difficulty in latching on the breast, premature and low birth weight babies, disruption during feeding, hospitalization due to any reason and nose block. The myths prevalent in society which interfere with breast feeding like ghutti, gripe water, honey and butter should be given at birth, milk is not enough during first few days after birth, baby remains hungry even after giving breast milk for enough time, breast feeding need extra water in hot weather, mother should stop breast feeding if she get pregnant and breast feeding is not possible after cesarean section were also endorsed. The proforma was filled by a medical officer who has pediatric experience of more than one year. Collected data was analyzed by using SPSS version 15 and frequency and percentages were calculated.

RESULTS

Out of 543 children, 262 (48%) were up to six months of age, 178 (33%) were 7 to 12 months and 103 (19%) were 13 to 24 months of age. Out of 543 mothers 216 (40%) were less than 25 years of age, 308 (57%) were between 26 to 35 years of age and 19 (3%) mothers were between 36 to 45 years old. Primigravida mothers were 175 (32%) and multigravida 368 (68%). Male children were 263 (48%) and female 280 (52%). Working mothers were only 72 (13%) where as all others were house wives. Regarding maternal education only 22% were educated. Exclusively breast fed children were 219 (40%) and rest having bottle feeding along with breast feeding as mentioned in Table 1.

According to analysis of data the major maternal factors for termination of breast feeding were insufficient milk secretion 310 (57%), insufficient rest during first six weeks of post-partum 233 (43%), poor stamina 135 (25%), breast engorgement 138 (25%), working mothers 72 (13%) and cesarean section 101 (19%) (Table 2). The child factors which cause termination of breast feeding were formula feed 225 (41%), disruption or interruption during breast feeding 194 (36%), difficulty in latching on to the breast 145 (27%), premature and low birth weight 133 (24.5%) and twin pregnancy 32 (6%) (Table 3). Various myths of mothers which interfere and ultimately result in cessation of breast feeding were ghutti, gripe water, honey or butter should be given at birth 355 (65%), milk is not enough during first few days after birth 346 (64%), baby remains hungry even after giving breast milk for enough time 338 (62%), breast fed child need extra water in hot weather 295 (54%), mother should stop breast feeding if she becomes pregnant 340 (63%), breast feeding is not possible after cesarean section 220 (41%) and modern formula milk is as good as breast milk 201 (37%) (Table 4).

Table 1: Epidemiological data of mothers and children

<table>
<thead>
<tr>
<th>S/No</th>
<th>Variables</th>
<th>No of Cases (N=543)</th>
<th>% of cases</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>Age of children</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upto 6 months</td>
<td>262</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>7 to 12 months</td>
<td>178</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>13 to 24 months</td>
<td>103</td>
<td>19</td>
</tr>
<tr>
<td>2</td>
<td>Sex</td>
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<tr>
<td></td>
<td>Male</td>
<td>263</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>280</td>
<td>52</td>
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<tr>
<td>3</td>
<td>Parity</td>
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<tr>
<td></td>
<td>Primigravida</td>
<td>175</td>
<td>32</td>
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<tr>
<td></td>
<td>Multigravida</td>
<td>368</td>
<td>68</td>
</tr>
<tr>
<td>4</td>
<td>Age of mother</td>
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<tr>
<td></td>
<td>Upto 25 years</td>
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<td>40</td>
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<tr>
<td></td>
<td>26 to 35 years</td>
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<td>57</td>
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<td></td>
<td>36 to 45 years</td>
<td>19</td>
<td>3</td>
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<td>5</td>
<td>Feeding pattern</td>
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<tr>
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<td>Exclusive breast feeding</td>
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<tr>
<td></td>
<td>Exclusive bottle feeding</td>
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<td>42</td>
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<td>Occupational pattern</td>
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<td></td>
<td>House wife</td>
<td>471</td>
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<td></td>
<td>Working women</td>
<td>72</td>
<td>13</td>
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<td>Educational status of mother</td>
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<td></td>
<td>Illiterate</td>
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<td></td>
<td>Literate</td>
<td>117</td>
<td>22</td>
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Table 2: Maternal perceptions affecting breast feeding. (N=543)

<table>
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<tr>
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<th>Maternal factors</th>
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<th>%</th>
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<tr>
<td>1</td>
<td>Insufficient milk secretion</td>
<td>310</td>
<td>57</td>
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<tr>
<td>2</td>
<td>Insufficient rest during first six weeks of postpartum</td>
<td>233</td>
<td>43</td>
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<tr>
<td>3</td>
<td>Breast engorgement</td>
<td>138</td>
<td>25</td>
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<td>4</td>
<td>Poor stamina</td>
<td>135</td>
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<td>5</td>
<td>Breast pain</td>
<td>126</td>
<td>23</td>
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<tr>
<td>6</td>
<td>Severe maternal stress</td>
<td>107</td>
<td>20</td>
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<td>7</td>
<td>Cesarean section</td>
<td>101</td>
<td>19</td>
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<td>8</td>
<td>Mother on medicine</td>
<td>95</td>
<td>18</td>
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<td>9</td>
<td>Hypoplastic breast</td>
<td>75</td>
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<td>10</td>
<td>Nipple pain</td>
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<td>13</td>
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<td>11</td>
<td>Working women with early return to work</td>
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<td>12</td>
<td>Overactive startle reflex</td>
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</table>

DISCUSSION

Exclusive breast feeding is optimal for infant health.\textsuperscript{15} Breast fed children are known to grow optimally, perform better on developmental assessment task and have lesser allergies and infections as compared to formula fed children.\textsuperscript{10-18} Despite its known advantages breast feeding rates are sub-optimal world over. The focus of a large number of workers has been on factors that lead to lower breastfeeding rates. There is enough evidence to show that lack of information for mothers; poor knowledge amongst health workers; under qualified health workers providing advice and the use of didactic lectures adversely affects breastfeeding.\textsuperscript{19-21}

In Pakistan unfortunately exclusive breast feeding rates are much lower than what it should ideally be.\textsuperscript{22} Current study showed 40\% exclusive breast feeding, 18\% bottle feed and 42\% mixed feeding while Shiva et al\textsuperscript{15} showed 68\% exclusive breast feeding, 17\% bottle feed and 14\% mixed feeding.

Among maternal factors insufficient milk secretion was most common 57\% while it was 71\% in study done in Karachi.\textsuperscript{24} One of the study conducted in Australia found that for termination of breast feeding was maternal perception of insufficient milk, the real number of women who experience this is extremely low.\textsuperscript{25}

Insufficient rest in the first six weeks postpartum was the second most common reason for termination of breast feeding observed in 43\% cases as mother tired due to household work. If time spent on house hold work is reduced then mother will have enough rest and successfully and frequently feed their baby. The improvement in maternal nutrition both in quantity and quality throughout pregnancy and during lactation increases breast feeding duration.\textsuperscript{26}

In our study, 25\% mothers experienced breast pain, breast engorgement and poor stamina during lactation which is contributing factor of introducing formula milk while Siddiqua et al\textsuperscript{23} observed this problem only in 2.6\% mothers. Other problem like mastitis and hyperlactation were observed only in 4.6\% and 6.4\% mothers respectively.

Maternal illness, cesarean delivery and mother taking medication were observed in 20\% mothers while other studies showed maternal illness in 3.6\%\textsuperscript{22} and 2.9\%\textsuperscript{26} respectively. Cesarean delivery is major contributing factor of introducing formula feed due to uncomforted position and stitch pain.

In our study, 18\% of mothers could not continue breast feeding due to their jobs. Other studies observed mother employment 10\%\textsuperscript{23} and 11\%\textsuperscript{24} It was noted that though the mothers were well informed and counseled of benefits of exclusive breast feeding but the constrain of employment forced them to start bottle feeding as well.\textsuperscript{24,27}

Table 3: Mothers perception about child factors (N=543)

<table>
<thead>
<tr>
<th>S/No</th>
<th>Infant perception</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Formula feed</td>
<td>225</td>
<td>41</td>
</tr>
<tr>
<td>2</td>
<td>Disruption during feeding</td>
<td>194</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>Difficulty in latching on to breast</td>
<td>145</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>Incoordination of sucking/swallowing reflex</td>
<td>144</td>
<td>26.5</td>
</tr>
<tr>
<td>5</td>
<td>Hospitalization</td>
<td>139</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>Premature &amp; low birth weight</td>
<td>133</td>
<td>24.5</td>
</tr>
<tr>
<td>7</td>
<td>Poor sucking reflex</td>
<td>122</td>
<td>22.4</td>
</tr>
<tr>
<td>8</td>
<td>Oral thrush</td>
<td>119</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td>Long separation from mother</td>
<td>57</td>
<td>10.5</td>
</tr>
<tr>
<td>10</td>
<td>Pacifier</td>
<td>56</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>Rhinorrhea</td>
<td>56</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>Nose block</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>Respiratory distress syndrome and other illness</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>14</td>
<td>Twin pregnancy</td>
<td>32</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4: Myths about breast feeding in mothers (N=543)

<table>
<thead>
<tr>
<th>S/No</th>
<th>Myths about breast feeding</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ghutti, gripe water, honey or butter should be given at birth</td>
<td>355</td>
<td>65</td>
</tr>
<tr>
<td>2</td>
<td>Milk is not enough during 1\textsuperscript{st} few days of life</td>
<td>346</td>
<td>64</td>
</tr>
<tr>
<td>3</td>
<td>Mother should stop breast feeding if get pregnant</td>
<td>340</td>
<td>63</td>
</tr>
<tr>
<td>4</td>
<td>Baby remains hungry even after given breast milk for enough time</td>
<td>338</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>If mother has infection she should stop breast feeding</td>
<td>310</td>
<td>57</td>
</tr>
<tr>
<td>6</td>
<td>Many women do not produce enough milk</td>
<td>294</td>
<td>54</td>
</tr>
<tr>
<td>7</td>
<td>Breast fed child need extra water during hot weather</td>
<td>294</td>
<td>54</td>
</tr>
<tr>
<td>8</td>
<td>Diet of mother affects nursing infant</td>
<td>283</td>
<td>52</td>
</tr>
<tr>
<td>9</td>
<td>Breast feeding is not possible after cesarean section</td>
<td>220</td>
<td>41</td>
</tr>
<tr>
<td>10</td>
<td>Modern formula milk are as good as breast milk</td>
<td>201</td>
<td>37</td>
</tr>
<tr>
<td>11</td>
<td>After 12 months breast milk loses its nutritional value</td>
<td>188</td>
<td>35</td>
</tr>
<tr>
<td>12</td>
<td>If baby has diarrhea/vomiting, mother should stop breast feeding</td>
<td>188</td>
<td>35</td>
</tr>
<tr>
<td>13</td>
<td>Breast feeding infants need vitamins &amp; iron in 1\textsuperscript{st} six months</td>
<td>163</td>
<td>30</td>
</tr>
<tr>
<td>14</td>
<td>Mother can’t take any medication during breast feeding</td>
<td>156</td>
<td>29</td>
</tr>
<tr>
<td>15</td>
<td>Breast feeding is pain full</td>
<td>153</td>
<td>28</td>
</tr>
<tr>
<td>16</td>
<td>Mother should wash her nipple each time before breast feeding</td>
<td>148</td>
<td>27</td>
</tr>
</tbody>
</table>
In order to promote the practice of exclusive breast feeding prolonged maternity leave should be given to working mother after the delivery. They should be taught to express and store their breast milk which can be given to the infant with cup and spoon in their absence. Large institution where many women are employed should be provided a separate space to keep and breast feed their baby.24

Maternal psychological factors like lack of confidence, anxiety, stress, worry and dislike for breast feeding are also contributing factors for termination of breast feeding in our study. Lack of confidence in a lactating mother leads to initiate bottle feed which further reduces her confidence.15

Among infant factors which are responsible for termination of breast feeding like early introduction of formula feed was the most common in our study. The strong predictor of formula feeding was the time between birth and initiation of first breast feeding. Similar factors were found in other studies24,25 and introduction of bottle feed was due to mother’s perception of inadequate weight gain of baby on breast milk.24

Excessive crying of baby for various reasons like difficulty in latching on to breast and disruption during feed experienced by 27% and 35% of mothers which is considered by them as baby is not satisfied because of insufficient milk production. With correct knowledge, emotional support and encouragement mother’s confidence can be enhanced and she can breast feed her child exclusively. Improvement in maternal diet and reduction in time spent on household chores by lactating mother will have positive effect on breast feeding. The best time to motivate and prepare mother for breast feeding is during her antenatal visits.24,26

Faulty technique of breast feeding i.e. difficulty in latching on to the breast was another common contributing factor in this study. When the baby is poorly attached, breast milk is not effectively transferred; it may seem that milk is not enough. Use of bottles or soothers/pacifiers may lead to nipple confusion and baby sucks in poor position.15

One-fourth (26%) mothers of our study could not initiate breast feeding either due to hospitalization of infant in neo-natal care unit or maternal hospitalization due to illness which leads to mixed and formula feed later. The similar reasons was found in another study.23 Use of expressed breast milk in NICU and counseling regarding disadvantage of formula feed can solve this matter.

Other factors negatively impact on prolonged duration of breast feeding are premature and low birth weight infants, in coordination of sucking and swallowing reflex observed in 25% mothers, twin baby 6% and use of pacifier10%. These factors were also observed in another study.23

There are certain myths which exist in our society and they interfere with exclusive breast feeding as well as result in termination of breast feeding are prelacteal feed like ghutti, gripe water, honey and butter should be given at birth, breast milk is not sufficient during first few days of life, baby remains hungry after sucking at breast for sufficient time, diet of mother affects nursing infant, breast fed child need extra water during hot weather, breast feeding is not possible after cesarean delivery and breast feeding should be stopped if mother get pregnant. About 60% to 65% of mothers of this study had these misbelieves. Water and sugar was used to alleviate thirst and to relieve abdominal colic in one study,23 and in another study honey and water was used as first feed.26

**CONCLUSION**

Prelacteal feed is most common reason for not initiating the exclusive breast feeding while inadequate milk production is common reason for not continuing breast feeding up to 2 years of age.

Disruption during breast feeding due to burden of household work and mother employment are major factor for introducing formula feed.

Prematurity, low birth weight and twin babies are responsible for formula feeding.

Various myths of mothers which interfere and responsible for cessation of breast feeding.

**RECOMMENDATIONS**

The peripartum policies and practices that optimize breast feeding initiation and maintenance should be encouraged.

Good antenatal care and screening of high risk pregnancies and measures to prevent premature deliveries.

Education of both parents before and after delivery of the child is an essential component of successful breast feeding.

Educate the mother about the proper breast feeding technique and managing problems of lactation to enhance the mother’s confidence.

Promote breast feeding through electronic media.

**REFERENCES**


Factors associated with cessation of breast feeding


ORIGINAL ARTICLE

Knowledge, Attitude and Practices of Breast Self Examination (BSE) in Women of Karachi

Rabail Raza, Masood Hussain Rao and Sadia Raza

ABSTRACT

Objective: To assess the knowledge, attitude and practices of breast self examination (BSE) in women attending gynecological units of major public sector hospitals of Karachi.

Study Design: Cross sectional survey.

Patients and Methods: All women of age between 20-50 years of either marital status attending Gynae OPD of Civil Hospital and Jinnah Postgraduate Medical Center, Karachi from May 2010 to December 2010 were included in the study. A verbal consent of each participant was obtained before collecting the data. The data was collected through a structured questionnaire have information on socio economic data, knowledge about Breast Self Examination, symptoms, risk factors and preventive methods regarding breast cancer, attitude of the respondent and practices regarding Breast Self Examination.

Results: Out of 412 respondents, majority belongs to 30-39 years age group (43.7%). Knowledge about breast self examination was found in only 22.8% respondents. Knowledge about symptoms, risk factors and preventive measures regarding Breast cancer were 25.3%, 28.7% and 26.0% respectively. However majority of the women 98.9% who have the knowledge were practice the Breast Self Examination monthly or fortnightly. The attitude regarding Breast Self Examination was very encouraging as 97.3% of the respondents promised not only to adopt it in future but also recommend it to their relatives and other friends.

Conclusion: The knowledge about Breast Self Examination was very low in the respondent which is the easier way of early detection of different breast diseases specially, breast cancer. However those who know it are doing it well. The attitude of the respondents was very encouraging. Awareness programme should be developed to promote it for early detection of Breast cancer.

Key words: Breast, cancer, breast self examination.

INTRODUCTION

Cancer remains one of the leading causes of morbidity and mortality worldwide. Among major sites of the cancers, breast cancer is the most common in women in U.S and probably world wide as it is responsible for 21% of new cases world wide. In 2008, 1.38 million women were diagnosed for breast cancer and 0.46 million died form it. Out of 411,000 breast cancer deaths reported around the world in 2002, 54% were occurred in low-middle income countries. By 2010; majority incidence of new cases of breast cancer was diagnosed in women of developing countries which were estimated approximately 1.5 million. Similarly it is estimated that the new mortality from breast cancer will increase by over 100% in the developing countries by 2020.

The incidence of breast cancer is highest in Pakistan among all Asian countries and almost 83%of all such cases are in 3rd stage of disease. In two Karachi based studies conducted in 1995-1997 and 2002, it was reported the highest incidence of breast cancer for population.

It is estimated that about 50% of cancers are curable if they are detected early and treated appropriately. Thus screening has a major role in early diagnosis. In this context, Breast Self examination (BSE) is a useful method for detecting breast cancer at interval of periodic clinical examination. BSE is relatively safe, low cost offers monthly assessment and does not require overcoming barriers associated with access to medical care system.

Thus the rationale of this research is to determine the knowledge, attitude and practices of Breast Self Examination in women. It will also helpful in developing the strategies for awareness of prevention as well as early detection plan for breast cancer.

OBJECTIVE

To assess the knowledge, attitude and practice pattern regarding Breast Self Examination in women of Karachi.
PATIENTS AND METHODS

The study was conducted from May 2010 to November 2010 at gynecology OPD’s of Jinnah Post graduate Medical Center (JPMC) and Civil Hospital, Karachi. Over all 412 women were interviewed. All women were between the age of 20-50 years regardless of marital status willing to participate in the study were enrolled. The women who already had carcinoma of breast or any other disease of breast were excluded. A verbal consent of each individual was taken before interview after explaining the objectives of the study. A pre structured proforma was used to collect the demographic data (marital status, education, literacy rate, family income etc), the data for knowledge about Breast self examination, breast cancer, symptoms and preventive measures for breast cancer, attitude and practices patterns regarding breast self examination of the respondent. The collected data were then analyzed through computer with the help of SPSS version 16. The quantitative data like age was analyzed for mean±s.d, where as the qualitative data regarding knowledge, attitude and practicing pattern were analyzed for frequencies and percentages. Chi-square test was applied to assess the significance of the data.

RESULTS

Over all data was collected from 412 respondents. Out of which 243 respondents (59.0%) were from Civil Hospital Karachi and 169 respondents (41.0%) were from Jinnah postgraduate Medical center, Karachi. Majority 311 (75.5%) of the respondents were between the age of 30-49 years followed by 76 (18.4%) belongs to age group 115-29 years. Out of 412 respondents, 337(81.8%) were married. Majority were literate belongs middle income group and belongs to Karachi. (Table 1)

Majority of the respondents were literate, middle income socio Economic group, urdu speaking and habitants of Karachi. Majority of the respondents (71.1%) have adequate knowledge that females was suffering more with breast cancer as compared to male (P<0.003). Over all knowledge of respondent about symptoms of breast cancer was just 25.3%. Only few respondents 47 (11.5%) did not know anything about symptoms of breast cancer. Majority of the respondents were of the opinion that these symptoms were not developed in cancer as this is a silent killer disease. Only one symptom i.e. lump that can be felt was a known symptom by 69.2% of the respondents (P<0.001). The knowledge about breast self examination was very low among the respondents as only 22.8% knew about it. (Table 2)

Regarding risk factors of the cancer development, the knowledge was also very low. Out of 412 respondents, 112(27.2%) did not know about any risk factor. Family history was the major known risk factor as 40.0% respondents indicated it due to some of family member affected with this disease, followed by personal history (35.4%), being women (30.6%) and late pregnancy or no pregnancy (25.2%).

Knowledge about over all preventive measures for breast cancer, majority 74.0% did not know much about it. However the most common known preventive method was consideration of breast feeding instead of formula milk. (293 i.e. 71.1%) followed by children at early age (181 i.e. 43.9%) and physical activity (141 i.e. 34.2%). The rest of the preventive methods have very little response.

According to the responses of the participants, out of 412, only 94 women have the knowledge regarding breast self examination. However out of these 94 women, 93 (98.9%) practicing it. The most common method was manual examination which was used by 87 (92.6%) respondents. In reply to a question that how often you examine your breast yourself, 39 (41.1%) doing it monthly and only 2 i.e.2.1% are doing it weekly. Out of 94 who examine their breast 4 indicated the feeling of abnormalities.

Out of 412 respondents, majority (401 i.e. 97.3%) made promise to adopt Breast Self Examination in their life in future. They also promised to recommend it to their friends and other relatives.

According to the cross tabulation of the data, age of the patients did not play any significant role in determining the knowledge attitude and practice pattern of breast self examination. However marital status i.e. married plays a significance role in determining the knowledge of breast self examination as compare to unmarried (P=0.03). Educational status plays a significant role in all aspects, except how often they examine their breast and knowledge about mammography. (P<0.001).

DISCUSSION

In Pakistan, majority breast cancers presented at an advanced stage. The breast cancer diagnosis in Pakistan can be improved through practical interventions that are realistic and cost effective. Breast Self Examination is one of the effective measure for early detection of breast cancer plan.13

A study conducted in Lahore in 2009 showed lack of awareness regarding breast cancer and its screening practices. In that study, 189 patients were surveyed, out of which 84% had heard of breast cancer, 35% were aware of at least one risk factor, 65% knew at least one major sign and symptom and 85% believed that early detection of breast cancer improved survival
Table 1: Socio-demographic data of the respondents

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>Civil Hospital Karachi No=243(59.0%)</th>
<th>Jinnah Postgraduate Medical Center, Karachi No=169(41.0%)</th>
<th>Total (%) No=412(100.0%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) &lt;30 Years</td>
<td>72 (29.6%)</td>
<td>4 (2.4%)</td>
<td>76 (18.4%)</td>
</tr>
<tr>
<td>ii) 30-49 years</td>
<td>158 (65.0%)</td>
<td>153 (90.5%)</td>
<td>311 (75.5%)</td>
</tr>
<tr>
<td>iii) 50 and above</td>
<td>13 (5.4%)</td>
<td>12 (7.1%)</td>
<td>25 (6.1%)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) married</td>
<td>191 (78.6%)</td>
<td>146 (86.4%)</td>
<td>337 (81.8%)</td>
</tr>
<tr>
<td>ii) unmarried</td>
<td>46 (18.9%)</td>
<td>14 (8.3%)</td>
<td>60 (14.6%)</td>
</tr>
<tr>
<td>iii) widow/divorced</td>
<td>6 (2.5%)</td>
<td>9 (5.3%)</td>
<td>15 (3.6%)</td>
</tr>
<tr>
<td><strong>Educational status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) illiterate</td>
<td>45 (18.5%)</td>
<td>34 (20.1%)</td>
<td>79 (19.2%)</td>
</tr>
<tr>
<td>ii) less than Matric</td>
<td>53 (21.8%)</td>
<td>59 (34.9%)</td>
<td>112 (27.2%)</td>
</tr>
<tr>
<td>iii) Matric and above</td>
<td>145 (59.7%)</td>
<td>76 (49.0%)</td>
<td>221 (53.6%)</td>
</tr>
<tr>
<td><strong>Income level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Up to Rs.7000</td>
<td>30 (12.4%)</td>
<td>46 (27.2%)</td>
<td>76 (18.5%)</td>
</tr>
<tr>
<td>(Low income group)</td>
<td>204 (83.9%)</td>
<td>123 (72.8%)</td>
<td>327 (79.4%)</td>
</tr>
<tr>
<td>ii) 7001-20000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Middle income group)</td>
<td>9 (3.7%)</td>
<td>---</td>
<td>9 (2.1%)</td>
</tr>
<tr>
<td>iii) 20001 and above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(High income group)</td>
<td>186 (76.5%)</td>
<td>121 (71.7%)</td>
<td>307 (74.5%)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Muhajir</td>
<td>17 (7.0%)</td>
<td>22 (13.0%)</td>
<td>39 (9.5%)</td>
</tr>
<tr>
<td>ii) Sindhi</td>
<td>7 (2.9%)</td>
<td>5 (2.9%)</td>
<td>12 (2.9%)</td>
</tr>
<tr>
<td>iii) Baluchi</td>
<td>8 (3.3%)</td>
<td>3 (1.8%)</td>
<td>11 (2.7%)</td>
</tr>
<tr>
<td>iv) Pushho</td>
<td>12 (5.0%)</td>
<td>5 (2.9%)</td>
<td>17 (4.1%)</td>
</tr>
<tr>
<td>v) Panjabi</td>
<td>13 (5.3%)</td>
<td>13 (7.7%)</td>
<td>26 (6.3%)</td>
</tr>
<tr>
<td>vi) others</td>
<td>186 (76.5%)</td>
<td>121 (71.7%)</td>
<td>307 (74.5%)</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Karachi</td>
<td>238 (97.9%)</td>
<td>163 (96.4%)</td>
<td>401 (97.3%)</td>
</tr>
<tr>
<td>ii) Outside Karachi</td>
<td>5 (2.1%)</td>
<td>6 (3.6%)</td>
<td>11 (2.7%)</td>
</tr>
</tbody>
</table>

Table 2: Knowledge of the respondent regarding Self Examination of Breast

<table>
<thead>
<tr>
<th>Knowledge assessment N=412</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you know that females are suffering more with Breast cancer?</td>
<td>293 (71.1%)</td>
</tr>
</tbody>
</table>

Knowledge about Symptoms

| i) Breast becomeswarming | 21 (5.1%) |
| ii) Flat or inverted nipple | 77 (18.7%) |
| iii) Breast often itching | 35 (8.5%) |
| iv) Swollen or increase in size | 114 (27.7%) |
| v) Breast become red or blotchy | 63 (15.3%) |
| vi) Discharging from nipple | 135 (32.8%) |
| vii) Persistent tenderness of breast | 147 (35.7%) |
| viii) Pain in the nipple | 145 (35.2%) |
| ix) A lump that can be felt | 285 (69.2%) |
| x) Skin around the breast is dimpled and looks like an orange peel | 19 (4.6%) |

Do you know Self Examination of Breast? | 94 (22.8%) |

Do you know about mammography? | 15 (3.6%) |

Knowledge about risk factors

| i) Being a women | 126 (30.6%) |
| ii) Early onset of menses (before 12 years of age) | 56 (13.6%) |
| iii) Family history | 165 (40.0%) |
| iv) Diet contain excess saturated fats | 85 (20.6%) |
| v) Late pregnancy or no pregnancy | 104 (25.2%) |
| vi) Personnel history | 146 (35.4%) |
| vii) Late menopause after the age of 55 years | 65 (15.8%) |
| viii) Use of oral contraceptive | 24 (5.8%) |

Knowledge about preventive measures/early detection methods

| i) Physical activities | 141 (34.2%) |
| ii) Be aware of family history | 82 (19.9%) |
| iii) Avoid hormone replacement therapy | 25 (6.1%) |
| iv) Check your breast every month | 60 (14.6%) |
| v) Try to keep a low fat diet | 67 (16.3%) |
| vi) Don’t forget mammography once in a year | 7 (1.7%) |
| vii) Have children at early age | 181 (43.9%) |
| viii) Consider breast feeding instead of formula milk | 293 (71.1%) |
chances. Out of these 189 women, 101 women who were >40 years of age practiced breast self examination.\textsuperscript{14} According to our study, most of the women (71.1%) had adequate knowledge that females are suffering more from breast cancer than males. 25.3% females were aware of the symptoms of breast cancer. Whereas, 69.2% believed that lump was the only symptom of breast cancer.

In another research in Yemen on knowledge and practices of BSE, out of 425 females only 58.6% knew about BSE and only 17.4% performed it. Majority (55.9%) mentioned lack of knowledge about technique of BSE as a barrier for not performing it.\textsuperscript{15} Similar results were obtained from a research which concluded that women still have lack of knowledge about breast cancer, cancer detection, and risk factors. Further more females fail to practice BSE according to current guidelines.\textsuperscript{16} Our study results show much low knowledge about BSE. According to our study results, out of the 412 cases, only 94 (22.8%) respondents knew about it. However out of these, 93 (98.9%) practiced BSE. Out of these 41.1% did it fortnightly or monthly.

As observed by another research, which related the level of knowledge of primary prophylaxis with the level of education. Out of 300 females surveyed, 50% knew what is mammography.\textsuperscript{17} Our research showed that, education plays a vital role in all aspects except the frequency of breast examination and knowledge of mammography (p<0.001). It was also seen that the age of patients did not play any significant role in detecting the knowledge, attitude and practice of BSE. However, marital status plays a significant in detecting the knowledge of BSE as compared to unmarried (p<0.03).

A Karachi based study showed that women had very limited knowledge of breast self examination. The knowledge about the risk factors also came out to be very low, where 27.2% respondents did not know about any risk factors. Family history (40.0%) was consider as a major risk factor, followed by personal history (35.4), being women (30.6) and early or no pregnancy (25.2%). Majority of respondents (74.0) had no idea about preventive measures, however most of them (71%) considered breast feeding and some (43.9%) thought that children at early age will lower the chances of breast cancer.

There is a possibility that because of demographic changes and lack of knowledge about early detection and treatment in the developing world, there will be continuous increase in the incidence of mortality of breast cancer.\textsuperscript{18} Hence to raise awareness, more focused health educational interventions are needed.\textsuperscript{19} An example of which is the Royal college of Nursing of United Kingdom, which is actively encouraging all nurses to promote breast awareness along with clear guidelines for doing so.\textsuperscript{20} There is a need to expand low cost alternatives for earlier detection and treatment of breast cancer in the developing countries. Basic interventions focus on education awareness building and health of women and expanding capacities at primary and community health care. Education to improve breast health awareness, BSE and clinical breast examination are relatively inexpensive and can be incorporated into existing primary health infrastructures. Focusing on providing these interventions in locations where these do not currently exists could drastically improve survival.\textsuperscript{21}
CONCLUSION

Our study showed that the surveyed women were aware of the lethal disease of breast cancer but had little education regarding its early detection and preventive measures. It also pointed out towards the lack of interest on the part of health care providers in creating awareness about BSE practice and its useful outcomes. The knowledge about breast self-examination was very low in the respondents which is the easier way of detecting cancer at early stage. However those who knew it were doing regularly. The attitude of the respondent was very encouraging. Awareness programme should be developed to promote it for early diagnosis and treatment of breast cancer.

REFERENCES

SHORT COMMUNICATION

Knowledge, Attitude and Practices of Dental Faculty regarding the Disinfection of Acrylic Materials Working in Dental Institutions/Colleges in Karachi, Pakistan

Shumaila Iqbal Moosa,1 Faiza Amin1 and Muhammad Abbas2

INTRODUCTION

Dental care providers are at high threat of receiving cross-infection while treating patients. This occupational impeding for disease transmission becomes understandable as it is known that most human microbial pathogens are isolated from oral secretion.1 On the other hand, majority of carriers of infectious diseases cannot be easily identified.2 Research shows that many infections can be transmitted by blood or saliva as a result of direct or indirect communique, droplets, aerosols, or contaminated instruments and equipment. Therefore, it is implicated that infective vulnerability is there in dental practice.3 All dental tools used in Prosthodontic department like impressions, cast models and prostheses must be appropriately disinfected before being sent to the prosthetic laboratory as well as after their return to the dental office, before their placement in the patient’s mouth.4

Simply washing or rinsing prosthetic material in running water cannot guarantee the complete removal of contaminating organisms.5 Chemical disinfection has been recommended with the intend to shun the cross-contamination by dissemination of pathogenic agents, by the use of glutaraldehyde, sodium hypochlorite, iodoform, chlorine dioxide or alcohol solutions.6 The application of universal precautions in dental surgeries is positive in preventing microbial load and cross-contamination. This practice is supported by organizations such as the Centers for Disease Control and Prevention, the American Dental Association and most of the other health agencies and professional associations.7 Universal precautions consider that all patients have to be considered as infectious patients and precautions must be applied for all of them.8

Alas! the infection control policies for control of spread of infection in developing countries are not acknowledged widely.9 Usually hospitals have no infection control programs as there is no awareness about the gravity of the problem and also because of lack of qualified staff.10

KAP surveys about several issues have been carried out in numerous countries.11 However, there is no report in literature about KAP study with regard to disinfection practices in Prosthodontics Departments in Dental Colleges/Institutes in Karachi, Pakistan. The importance of this KAP study is that it brings into consideration the present status of disinfection of Acrylic Material and also creates awareness about the importance of disinfection protocols.

MATERIAL AND METHODS

This was a questionnaire based study which took place in one month’s time (April 2010). The study was conducted in Departments of Prosthodontics of Dental colleges/institutes in Karachi, Pakistan. The Head of the Department in each dental college/institute was personally approached by the researchers, who informed the head about the purpose of study and about the methodology which was to be practiced. Total 51 Doctors were questioned from Dental Colleges of Karachi including Dr Ishrat ul Ibad Khan Institute of Oral Health Sciences (DIKIOHS), Fatima Jinnah Dental College (FJDC), Jinnah Medical and Dental College (JMC), Baqai Medical and Dental University (BMDU), Hamdard Medical and Dental University (HMDU), Altamash Institute of Dental Surgery (AIDS), Sir Syed Medical and Dental College (SSMDC), Liaqat Medical and Dental College (LMDC) and Karachi Medical and Dental College (KMDC). A self-administered questionnaire was designed to obtain

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information about procedures used for the disinfection of acrylic materials in dental practices and to determine the attitudes and perceptions of respondent dental practitioners towards the process of disinfection. The employed questionnaire was in its initial stages being properly legitimated in a pilot study which was conducted at DIKIOHS to assess Dental surgeons' perception of the instrument about attitudes and behavior regarding disinfection of Acrylic Material. Their comments proved to be of great help for improving the questionnaire.

The approval for the study was taken by Associate Dean Post Graduate Programs Dental faculty and MDS Program Director, Dr Shahjahan Katpar of DIKIOHS, DUHS. The study population included all Professors, Associate Professor, Senior Registrar, Registrar, Senior Resident, Trainees, Demonstrator and House Officers working in the Prosthodontics Department. All participants who filled the questionnaire were informed about the survey distribution and also about the number and type of questions, covered content and were given declaration that the secrecy would be preserved. Informed consent forms were not distributed and only verbal consent was taken. The questionnaire was personally handed out to each Dental Surgeon. The questionnaire asked for data on demographic characteristics, knowledge about the disinfection of acrylic materials, how and at what concentration disinfection solution is used in their department, their attitude toward above mentioned knowledge and their practice of disinfecting custom trays and dentures. Data was entered and analyzed using SPSS version 16.

RESULTS

Sixty eight percent of the dental faculty questioned believed that disinfection of acrylic custom tray, acrylic base plate and acrylic denture is important. Only 34% and 5% of the faculty practices disinfection of custom tray before and after impression making respectively. When the duration of procedure, appropriate disinfectant and method were asked for acrylic material disinfection, following responses (Figure 1, 2 and 3) were attained.

As evident from data, most of the dental surgeons questioned are un-aware about the duration of procedure of disinfection, appropriate disinfectant and method for acrylic material disinfection. Data obtained is worrisome. This implies that majority of the faculty is not familiar with the actual and correct protocol for disinfection of acrylic materials and is therefore not performing the protocol of disinfection.

CONCLUSION

The result notifies that awareness regarding the connotation of disinfection of Acrylic Material is present but dental faculty holds insufficient knowledge about the appropriate procedure for disinfection of Acrylic Material and no disinfection protocol is followed in Dental Colleges/ Institutes for disinfection. One reason for the lag is that no universal protocol is available for disinfection. The need of the time is that Dental Colleges/ Institutes develop there respective protocols and senior faculty should ensure that this protocol is practiced by all Dental Surgeons working in Prosthodontic Department. By doing so the institutions would assure the safety of their students and faculty and would also minimize the chances of transmission of diseases in the society.
**Acknowledgement:** First of all we pay our humble thanks to Almighty Allah and next to our families and friends for their encouragement and support. We acknowledge the services of Dr. Gul-e-Erum of Orthodontics Department of DIOKHS for her valuable guidance in the process of finalization of questionnaire and Dr. Tahir Khan of Epidemiology Department of Sindh Medical College (SMC) for his meticulous support with SPSS. We offer our deepest gratitude to all HODs of Prosthodontics of Dental Colleges/Institutes we visited and surveyed.

**REFERENCES**


SHORT COMMUNICATION

Perception and Preferences of Undergraduate Medical Students Regarding the Use of Contemporary Teaching Aids at Dow International Medical College, Karachi

Atif Mahmood,1 Fahmida Khatoon,2 Mukarram Ali,3 Saima Ejaz,1 Kamran Afzal1 and Masood A. Qureshi1

ABSTRACT

In this study, perception and preferences of the medical students’ studying at Dow International Medical College have been described about the use of different teaching aids.

Methods: Cross sectional survey was conducted on a stratified random sample of 200 undergraduate medical students during the month of October 2010 at Dow International Medical College, Karachi, Pakistan.

Results: 80% of the students responded to the questions asked. Over all 40% of the students chose PowerPoint presentations as a reliable mode of teaching and favoured it as interesting and interactive teaching aid over Problem Based Learning (28.8%), Audio visual Aid (18.6%) and White Board (12%). They believe that PowerPoint provides a better learning experience as compared to other teaching tools. Projectors as a teaching tool was rejected by the students.

Conclusion: This article serves as a source of valuable information for the faculty members. Students have chosen PowerPoint presentations as the best teaching aid and have preferred the integration of different teaching tools for better understanding. Teachers will be able to use this information to develops better understanding about the subject matter among students by considering their learning style preferences. It will also facilitate them in developing interest and active participation of students in the classroom.

INTRODUCTION

The primary mode of delivery has been shifted to more students centered approach to deliver the core knowledge with sound concepts of the subject.1 The learning capabilities and learning styles of students vary which can be improved by providing contextual opportunities to the students. Different learning strategies can attract the active participation of the learners,2 which enhance their understanding and learning of the subject.3 The faculty members must have thorough knowledge of the subject matter along with awareness of the learners’ characteristics and learning styles preferences to be effective.4 Learning style describes the manner and environment of information delivery, which enables the learner to perceive, process, store and recall the information efficiently and effectively.5 More than 70 different learning styles have been identified which emphasize the various characteristics of the learner’s preference. It includes style of processing the information and cognitive personality style. Learning can be through cognitive, affective and psychomotor domains. Students have shown to grasp new knowledge by the help of visual, auditory and tactile sensory modalities.6 The study was designed to determine the perception and preferences of the undergraduate medical students’ and about the use of contemporary teaching aids.

MATERIAL AND METHODS

In the present study, 200 undergraduate medical students were asked to fill a questionnaire which was designed carefully after literature review and some of the questions were adapted from similar studies.7 Statistical Package for the Social Sciences (SPSS version 17.0) was used to analyze the data using descriptive statistics. An informed consent was obtained from every student and confidentiality was assured.
RESULTS AND DISCUSSION

A stratified random sample of 200 undergraduate medical students was taken out of which 100 were males and 100 were females. At the time of study, 25% students were studying in first year, 40% in second year and 35% in third year of their medical education. Twenty percent students were 19 years old, 25% were 20 years old, 20% were 21 years old whereas 35% were 22 years old.

Table 1 represents the perception and preferences of the undergraduate medical students’ towards different teaching aids.

Thirty seven percent students favored PowerPoint presentations whereas 26% and 17% considered White Board (WB) and Case Based Learning (CBL) respectively as a reliable teaching tool. 42% students considered that PowerPoint presentations develop the ability to understand the topic better while 32% and 16% students think that Case Based Learning and audio visual aids respectively can help them develop the ability to understand better. 44% students agreed that PowerPoint presentations provides a better learning experience as compared to Case Based Learning 28% and audio visual aids 21% and white board teaching 11%. 33% students gave overall preference to Multimedia / PowerPoint presentations. 26% preferred PBL, 24% preferred audio visual aids and 16% students preferred white board teaching. Multimedia / PowerPoint presentations teaching were also preferred as an interesting, interactive type of teaching aid by 44% students. 42% students thought PBL to be more interesting and interactive while 24% opted for audio visual aids and 12% for WB teaching. Students rejected the teaching by means of Overhead projector. Only one student considered OHP as the preferred mode of teaching and favored it as a reliable teaching aid that provides a better learning experience.

Students need to memorize number of facts but developing concepts is fundamental to the understanding of medical sciences. The process of understanding involves the ability to assimilate and recall the thoughts, ideas and knowledge about a particular subject matter. It also includes predicting the behavior of body systems and able to explain responses to specific stimuli. Students develop concepts and acquire facts through lectures and textbooks. Several different teaching methodologies can be employed; each has its advantages and disadvantages. Lecture is used to deliver information to larger masses but it is usually a one-way communication and involves minimal engagement of the students. It takes active involvement of the student with the subject matter to develop understanding that is mostly not achieved in the lecture halls.

Chaudhary et al., have mentioned in their study that students favored blackboard (BB) teaching as a better visual teaching aid instead of transparencies on OHP. The biggest disadvantage in BB teaching is that the complex diagrams are difficult to draw and time consuming and requires a lot of drawing skills on part of teacher. It is not worthy that while drawing a diagram; teacher’s eye contact is also broken with students. Similar problems are encountered with the Whiteboard as well. In our study too, only few students favored WB teaching (12%) highlighting the same problems whereas OHP (0.6%) has not been accepted by the students as a tool for modern teaching.

Understanding the merits and demerits of using PowerPoint as a teaching aid is important academically as well as practically. Rocklin proposed that PowerPoint can facilitate teachers to “help their students learn”. Over all 40% of the students chose PowerPoint presentations to be a reliable mode of teaching and is in agreement with the findings of Rocklin who favored it as interesting and interactive teaching aid over PBL (28.8%), Audio Visual Aid (18.6%) and White Board (12%).

Table 1: Perception and preferences of the undergraduate medical students’ towards different teaching aids

<table>
<thead>
<tr>
<th>Questions asked</th>
<th>Frequency of responses obtained from the students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WB*</td>
</tr>
<tr>
<td>Which tool is reliable?</td>
<td>34</td>
</tr>
<tr>
<td>Which mode develops the ability to understand the topic better?</td>
<td>20</td>
</tr>
<tr>
<td>Which mode provides better learning experience?</td>
<td>22</td>
</tr>
<tr>
<td>I prefer...</td>
<td>32</td>
</tr>
<tr>
<td>Which is more interesting and interactive teaching aid?</td>
<td>12</td>
</tr>
</tbody>
</table>

*White Board, § Over Head Projector, ‡ PowerPoint Presentations, ¶ Audio Visual Aid, Problem Based Learning
Several studies have shown that students consider video based demonstrations as an effective learning tool\(^1\) and the role of PBL in actively involving the students in learning process is identified in several studies as well.\(^2\)-\(^5\) Studies show that students have achieved higher scores in undergraduate courses when teaching style was designed according to their learning style preferences.\(^6\) Teachers, thus, will be able to use this information to develop better understanding of the subject matter among students by considering their learning style preference.

REFERENCES

CASE SERIES

Failure to Thrive, Can this be Bartter’s Syndrome?

Nighat Aijaz,1 Saia Waqar Lone,2 Nasrul Huda,3 S. Shakil Ahmed Rizvi,4 and Abdul Gaffar Biloo5

ABSTRACT

A case series of four children, of different age groups, having complaints of polyuria and failure to thrive. These cases include two infants, a toddler and a child and investigations revealed that they had hyponatremia, hypokalemia, hyperchloremia and metabolic alkalosis, leading to a diagnosis of Bartter’s syndrome. Two of the patients also had hypomagnesemia. All the children were put on treatment for Bartter’s Syndrome, and they responded well but unfortunately one of them was lost to follow-up.

Key words: Failure to thrive, Bartter’s Syndrome, Polyuria, Metabolic alkalosis.

INTRODUCTION

Bartter’s Syndrome is a rare form of renal potassium wasting characterized by hypokalemia, normal blood pressure and elevated plasma concentration of renin and aldosterone.1 Bartter’s Syndrome in Pakistan is a much neglected disease as it is thought to be quite rare here. ‘What mind doesn’t know, eyes don’t see!’ This phrase truly applies to Bartter’s syndrome. All children with failure to thrive, polyuria and polydipsia should be investigated for this problem. Quite a number of cases might just be missed if we particularly do not look for it.

Bartter’s Syndrome was first observed by Dr. Fredric Bartter. In 1962, Bartter et al. described a new disease entity in two African Americans who presented with metabolic alkalosis, hyperplasia of juxtaglomerular apparatus, and normotensive hyperaldosteronism.2 It is nowadays evident that this term does not represent a unique entity but encompasses a variety of disorders of renal electrolyte transport all characterized by a biochemical picture of “hyperreninemic, hypokalemic metabolic alkalosis”. Recent molecular biology findings have demonstrated that most of these patients have an inherited defect in NaCl transport in the distal nephron either at the gene encoding the renal bumetanide sensitive Na-K-Cl co-transporter (NKCC2) or the gene encoding an ATP-sensitive inwardly rectifying K-channel (ROMK). These mutations, however, have not been found in some patients and genetic heterogeneity is suspected.3

The biochemical features of Bartter’s syndrome, including hypokalemic metabolic alkalosis with hypercalciuria, resemble those seen with loop diuretic use and reflect a defect in sodium, chloride and potassium transport in the ascending loop of Henle. The loss of sodium and chloride, with resultant volume contraction, stimulates the renin/angiotensin II/aldosterone (RAA) axis. Aldosterone promotes sodium uptake and potassium secretion, exacerbating the hypokalemia. It also stimulates hydrogen ion secretion distally, worsening the metabolic alkalosis.

Hypokalemia stimulates prostaglandins, which further activates the RAA axis.4

Three forms have been described which are:

1 Neonatal (or Antenatal) Bartter’s Syndrome,
2 Classic Bartter’s Syndrome,
3 Gitelman’s Syndrome.4

The incidences of Bartter’s syndrome varies from country to country.22

<table>
<thead>
<tr>
<th>Country</th>
<th>Incidence</th>
</tr>
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<tbody>
<tr>
<td>Kwait</td>
<td>1.7/100,000</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.2/100,000</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>1.2/100,000</td>
</tr>
</tbody>
</table>

The incidence of neonatal Bartter’s Syndrome is 1 case per 50,000-100,000 newborns.6

Both familial and sporadic forms seen with mostly being autosomal recessive. There is no racial predisposition.
Gitelman’s syndrome is a much more common disease than Barter’s syndrome. The magnitude of difference was evaluated in a report from the Framingham Heart Study in which the estimated prevalence was approximately 1 per 40,000 for Gitelman’s syndrome and 1 per million for Barter’s syndrome. However, the prevalence of heterozygotes may be as high as 1 percent.

Unfortunately we could not find enough local data to quote the exact incidence of the disease in our country. Few case reports are published in Pakistan and India.

The diagnosis is usually made on the basis of the clinical presentation and laboratory findings. Because features of Barter’s syndrome resemble chronic loop diuretic use, diuretic abuse should be considered in the differential diagnosis, even in young children.

**CASE REPORT 1**

Two months old male infant weighing 2.7 kg was admitted with severe pneumonia. He was a term baby with a birth weight of 3.4 kg and issue of a consanginosus marriage. Since birth there was complaint of failure to thrive for which top feed with cup and spoon along with breastfeed was instituted. History of polyuria was also present. On examination, he was an emaciated baby with anthropometric measurements at <5th percentile. He was tachypnoeic and had subcostal and intercostals recessions. Rest of the systemic examination was unremarkable. Lab investigations showed a high TLC and a positive C-reactive protein for which I/V antibiotics were started. Electrolytes showed hyponatremia, hypochloremic alkalosis and hypokalemia (Na-107, K-2. 3, Cl-70, and HCO3-28). S.renin and Aldosterone levels were done which came out to be high despite a normal BP (S.renin-24 ng/dl, aldosterone-120 ng/dl). Serum Magnesium was normal (1.9 ng/dl) and there was no evidence of hypercalciuria. Serum urea and creatinine and ultrasound KUB were normal. The baby was put on oral rehydration therapy to which he responded and his electrolytes improved. Indomethacin was started and the general condition of the baby improved. He started gaining weight and his serum aldosterone and renin levels showed tremendous improvement after 8 weeks of therapy (s.renin:12 ng/dl, s.aldosterone:65 ng/dl). He is on a regular followup showing satisfactory growth.

**CASE REPORT 2**

Four years old boy weighing 7 kg was admitted with complaints of fever, cough, vomiting and loss of appetite for about ten days. This malnourished boy was thriving well till his first birthday when his problem of not gaining weight despite adequate nutrition started. His mother also noticed that he was passing excessive urine. At the age of two years he was hospitalized with diarrhoea, vomiting and tetany. He was managed for acute gastroenteritis and was treated for rickets. Although he never had tetany since then but still he was not thriving and always seemed to be thirsty and dehydrated. He is an issue of a consanginosus marriage and has three siblings. None of the siblings have any problem. On examination, severely dehydrated, malnourished, febrile child. H/R was 120/min., R/R was 36/min., BP was 80/60mmhg and the temperature was 103F. He had sunken eyes and was very irritable. The systemic examination revealed nothing significant. On investigations, his S.Electrolytes were deranged showing hyponatremia (112meq/l), hypokalemia (1.2meq/l), hypochloremia (80meq/l) and metabolic acidosis (HCO3-10meq/l). His CBC revealed mild neutrophilia and CRP was raised(60). There were few patchy infiltrates on the right side in the CXR.

S.Calciwm was very low (4.4mg/dl) and so was the magnesium (1.2mg/dl). There was no evidence of hypercalciuria. The child was rehydrated and was put on I/V Ceftriaxone after sending the blood for C/S. He was also given I/V calcium gluconate 8 hourly and therapeutic doses of Inj. Magnesium sulphate. After rehydration, his Ca and Mg levels improved but there was persistent hypokalemia (1.2-2.6meq/dl) and bicarbonate started increasing. With the history of polyuria, failure to thrive and persistent hypokalemia, Barter’s syndrome was suspected. His Renin was very high (>38ng/dl) and so was the Aldosterone (137.5ng/dl). U/S KUB was normal. The PTH level was high (probably due to a low calcium level).

We started treating him with the Oral Rehydrating Solution and oral Indomethacin (2mg/kg in three divided doses). The boy showed remarkable improvement within a week of therapy; his urinary output decreased and the overall condition improved. Within six weeks he started gaining weight and the Renin and Aldosterone levels improved. We discontinued oral magnesium and calcium after six weeks once the levels were normal. After two months we repeated the investigations which revealed decreasing levels of calcium, magnesium and persistently high levels of renin and aldosterone. At this point we increased the dose of Indomethacin and restarted calcium and magnesium.
Failure to thrive, can this be Bartter’s syndrome?

CASE REPORT 3

One and a half years old female child weighing 8.4 kg came to the OPD with the complaints of not gaining weight, polyuria and polydipsia for the last six months, with a history of head injury about eight months back for which a CT scan brain and an X-ray skull was done which were normal. She was a pretty looking lean-built child, issue of a consanguineous marriage and younger of the two siblings. Older sister is healthy. She had a normal BP but was slightly pale and quite irritable. Her general physical and systemic examinations did not reveal anything significant. On investigations, her RBS (both random and fasting) were normal. Hb was 9.6 g/dl, TLC was normal with a normal differential count. Urine D/R was also normal with a normal specific gravity. Serum electrolytes were deranged showing hyponatremia and hypokalemia. Serum rennin and aldosterone were raised (rennin-9.33 ng/dl and aldosterone-36 ng/dl). Serum Magnesium, Calcium and U/S KUB were normal. She started improving within six weeks of starting the treatment with oral Indomethacin (2 mg/kg in 3 divided doses).

CASE REPORT 4

Forty days old male infant, was admitted through the emergency ward with the history of fever, chronic diarrhea and failure to thrive since birth. This was his third admission in the last one month with similar complaints. He is the only child of this young couple who are first cousins. The baby was a full-term SVD, with a birth weight of 2.5 kg. He was breast fed up till 15 days of life after which he was supplemented with top feed through bottle in proper dilution. He had loose frequent stools since birth and also had polyuria as the mother had to change him every 15 minutes. On examination, he was a severely malnourished and had mottling all over the body. He had a toxic look, was dehydrated and very irritable. He had acidotic breathing, tachycardia with weak feeble pulses and was hypotensive. He was also hypothermic. There was oral thrush and angular stomatitis. The abdomen was distended with a tympanic note on percussion. There was no visceromegaly. Gut sounds were exaggerated. Investigations revealed signs of sepsis. His TLC was high with predominant neutrophilia. CRP was raised but the blood culture showed no growth. There was hypoglycemia (Random Blood Sugar 30 mg/dl), Hyponatremia (Na 112 mEq/L), hypokalemia (1.5 mEq/L), Metabolic acidosis (HCO3: 8 mEq/L). He was rehydrated, antibiotics were started and his hypoglycemia and hypokalemia were corrected. Subsequent electrolytes showed persistent hypokalemia.

After he improved from sepsis his HCO3 level also started rising. On this basis we investigated him for Bartter’s Syndrome. His Renin was high (22 ng/dl) but the aldosterone level was surprisingly normal (12 ng/dl). Mg was also low (1.4 mg/dl) but the Calcium level was normal (8.6 mg/dl). Renal U/S was also non significant. Labeling him as Gittleman we started treating him with oral indomethacin. The baby got better; he recovered from sepsis and was feeding well. His diarrhoea improved and urinary output decreased. After 2 weeks of the indomethacin therapy his electrolytes started improving but unfortunately we lost this patient to followup.

DISCUSSION

These case reports show the prevalence of different variants of Bartter’s Syndrome. Cases 1 and 2 are the Classical ones; Case-1 being the neonatal variant. Although case 2 has decreased magnesium levels but we cannot exactly classify it as Gittleman’s since the serum aldosterone and renin are very high in our patient and usually these levels are not that high in Gittleman’s. A few cases of classical Bartter’s do present with hypomagnesemia and hypocalcemia and we think that Case 2 belongs to this group. Since there is no hypercalciuria the low calcium in this case could be due to low magnesium levels. Case 4 is not a typical case of Bartter’s Syndrome. In this case the S.Aldosterone level is within the normal range but renin shows mild elevation. Although the electrolytes and magnesium levels improved with the prostaglandin inhibitor (Indomethacin) but still a proper follow up was required to put a final label of Gittleman’s on this baby.

All our cases, although with different disease presentations had one thing in common and that was failure to thrive! All were undernourished, height and weights below or on the 3rd centile despite being on adequate diets.

There is no definite cure for Bartter’s syndrome. The mainstay of therapy is to replace what is lost. There is a great variability of pharmacologic treatment. In a lot of cases prostaglandin inhibitors have been used with success. Recently, a selective cyclooxygenase 2 inhibitor was introduced for therapy of pediatric and adult patients with Bartter’s syndrome as an alternative to indomethacin. It was shown to have comparable efficacy and better tolerability profile. Indomethacin has no direct effect on inherited renal tubular abnormality. It is beneficial because it neutralizes the amplifying effect of prostaglandins on features of Bartter’s syndrome. However, Indomethacin therapy has been reported to be associated with gastrointestinal side effects like vomiting, stomachache, chronic diarrhoea,
gastric ulcer, chronic gastritis and gastroduodenal fistula.\textsuperscript{14} On the other hand, it has been suggested that nephrocalcinosis might only be reversed by indomethacin in the early stages of development.\textsuperscript{10,15}

Along with Prostaglandin inhibitors, angiotensin converting enzyme inhibitors such as Captopril may give additional control.\textsuperscript{11}

Some patients with pharmacologic treatment recover growth velocity and improvement in other symptoms while other patients have reduced growth percentiles and serum potassium and bicarbonate do not attain adequate levels. In younger patients growth hormone may be used to prevent short stature.\textsuperscript{17}

Dillon et al. used indomethacin in six of ten children for 6 to 24 months.\textsuperscript{19} In the study by Abdel-al et al., all patients were treated with an aldosterone antagonist (spironolactone) and a prostaglandin synthetase inhibitor (indomethacin or aspirin) sequentially.\textsuperscript{20} Growth hormone therapy was not given to our children. But studies have shown that nearly all patients with BS have growth retardation and are given growth hormone therapy along with potassium and indomethacin. A case report showed an association between BS and isolated familial growth hormone deficiency, with growth hormone therapy providing good results.\textsuperscript{21}

The study by Dillon et al. showed catch-up growth in all patients treated with indomethacin therapy with remarkable clinical and biochemical improvement.\textsuperscript{18,20}

Usually prognosis in many cases is good, with patients being able to lead fairly normal lives.\textsuperscript{3}

\section*{CONCLUSION}

BS should be suspected in any child with history of failure to thrive and metabolic alkalosis. Early diagnosis and treatment with NSAIDs are lifesaving.

\section*{REFERENCES}


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