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Evaluation of Causes Leading to Oligomenorrhoea and Secondary Amenorrhoea among Women in Reproductive Age Group

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Abstract: ***An observational descriptive cross-sectional study was conducted to evaluate the causes of oligomenorrhoea and secondary amenorrhoea among women between 20 to 40 years of age attending Gynaecology OPD. Total 250 patients who met the inclusion criteria were included in the study and divided into two groups: Group A(200 patients with oligomenorrhoea) & Group B(50 patients with secondary amenorrhoea).Most of the study population in both groups belonged to the 30-35 years age group. The difference in the mean age of the study population in both groups was not statistically significant (p=0.461).The average BMI of women in both groups was also comparable (22.46±2.8 kg/m^{2}Gp.A&21.8±3.7 kg/m^{2}in Gp.B). Most common cause in both groups was Polycystic ovarian syndrome (38%) in the present study. The other causes were Uterine (20%), Hypothalamic or Pituitary (11.2%),thyroid disorders(12%). Most common offending drug in present study was oral contraceptive pills (10.8%). No patients with eating disorders were found in the present study. Only a very small proportion of patients in both the study groups had mental depression.***

Keywords: Oligomenorrhoea, Secondary Amenrrhoea, Body Mass Index(BMI), Polycystic Ovarian Syndrome

1. Introduction

An essential component of women's sexual and reproductive health is menstrual health and any changes in the normal menstrual pattern may affect physical and psychological well being and quality of life.[1]Reproductive ill health comprising of contraceptive, obstetric and gynaecological morbidity among women, constitutes **32%** of total burden of disease in the world and **12.5%** in India.[2] Globally, among the reproductive age group, gynaecological morbidity leads to about **20%** loss of healthy life in total years.[3] In India , gynaecological morbidity constitutes **88.64%** of reproductive morbidities.[4]

A normal menstrual cycle requires integration of hypothalamic –pituitary –ovarian axis with normal functional uterus and anatomical reproductive tract. Any break in this axis affects menstruation. Thenormal range for menstrual cycles is between 21 and 35 days, with the flow lasting from 2 to 7 days. During the first 2 years after menarche, length of the menstrual cycle may be normal or abnormal due to immaturity of the hypothalamic-pituitary-ovarian axis.[5, 6, 7]

The Menstrual disorders have been defined in standard scientific literature as per following criteria:

Regular menstruation	Cycle repeated about once every 28+/-7 days with duration of 5–7 days.
Oligomenorrhoea	4-9 cycles in a year or cycle repeated at interval of 35 days or more.
Secondary amenorrhoea	Cessation of menstruation for at least 3 of the previous 3 cycle intervals or for at least 6 months.
Hypomenorrhoea	Duration of period less than 2 days and slight blood loss.
Polymenorrhoea	Frequent episodes of menstruation occurring at interval of 21 days or earlier.
Menorrhagia	Duration of period more than 7 days and blood loss more than 80 ml.
Dysmenorrhoea	Painful menstruation.
Pre Menstrual Syndrome	At least 3 of the most common symptoms occurring 10 days before menstruation and disappearing at the start of menstruation: painful or tender breasts, bloating or swelling of the abdomen, rapid mood changes

Amenorrhoea is the complete absenceof menstrual cycles in females during reproductive years. It is considered **physiological** during pregnancy, lactation and menopause. In all other situations, amenorrhoea is **pathological.**

Amenorrhoea is classified as primary and secondary.[8] **Primary amenorrhoea** is defined as absence of menarche by the age of 16 years in a girl withcomplete secondary sexual development, or by the age of 14 years in a girl without secondary sexual development. **Secondary amenorrhoea** is defined as absence of menstrual cycles for 6 consecutive months in a girl with irregular menses or for 3 consecutive months in a girl with regular menses.[9] According to the American Society for Reproductive Medicine, many causes of amenorrhea have been recognized: anatomic defects of the genital tract, hypothalamic/pituitary causes, ovarian insufficiency, endocrinopathies, chronic oligo - or anovulation and many others.[8]

Data regarding the pattern of distribution of menstrual disorders in the Indian Subcontinent is still copious and inconclusive. The present study aims to provide the pattern of distribution of the various causes of oligomenorrhoea and secondary amenorrhoea among women of reproductive age group in a metropolitan city in northern India.

2. Literature Survey

Various previous scientific studies have provided an insight into the causes of oligomenorrhoea and secondary amenorrhoea in recent and remote past. **Bachmann GA, Kemmann E** found that the prevalence of oligomenorrheawas 11.3% and that of amenorrhea was 2.6%in a study conducted in a college population from November 1979 to January 1980[10].

Koenig et al in**1996** showed that prevalence of menstrual disorders was high among the women in rural areas of Maharashtra (60%), and rural areas of Gujarat (59%).[11]

In a study conducted by **Armstomer MW** et al in Sweden, **2009,** the prevalence of menstrual disorder was studied among 203 adolescent girls. Of these, 117 had secondary amenorrhoea and 86 suffered from oligomenorrhoea. While analysing the social factors, the authors reported that 42% of girls with secondary amenorrhoea and 53% of the girls with oligomenorrhoea had family problems of serious nature ($p<0.01$). Statistically significant number of girls with secondary amenorrhoea had alcohol and drug abuse history among parents ($p<0.01$) and mental stress with strained social relations ($p<0.01$). All these findings show that social factors have a significant role in predicting the reproductive ill-health in any population.[12]

Vanithaet alstudied menstrual disorders among women of reproductive age group (15-49 years) in Tamil Nadu in **2013.** It was shown that mean age of 330 participants was 34.1 years and 61% had completed high school. More women **(76%)** belonged to upper and middle socio-economic class. It was observed that 44.8% of women had at least one menstrual disorder. Dysmenorrhoea**(22.7%)** and oligomenorrhoea**(12.1%)** were more common. Education acted as a protective factor for menstrual disorders. Low socio-economic status women had 1.8 times greater risk of dysmenorrhoea . Old age,anaemia and low educational level were associated with oligomenorrhoea.[13]

3. Methods

Study Design and Study Population: The study was a hospital based observational, descriptive cross-sectional study of women between 20 to 40 years of age attending GOPD with complaints of oligomenorrhoea and secondary amenorrhoea.

Sample Size: 200 patients with complaint of oligomenorrhoea and 50 patients with complaint of secondary amenorrhoea, attending GOPD of Hindu Rao Hospitalwere studied. The sample size was calculated by taking into consideration the prevalence of oligomenorrhoea to be 11-14% and secondary amenorrhoea to be 2-3%, with allowable error of 5%.

$$\text{Sample Size} = \frac{4 \times P \times Q}{L^2}$$

where, P=Prevalence,Q = 1- Prevalence and L = Allowable error

Inclusion Criteria: All women attending GOPD between 20 to 40 years of age with complaints of oligomenorrhoea and secondary amenorrhoea gave consent for participation in study.

Exclusion Criteria: Women between 20 & 40 years who did not give consent for participation in the study and those with physiological and primary amenorrhoea were excluded from the study.

Study Method: A written informed consent was obtained from women who met the inclusion criteria. A detailed menstrual history was taken including the symptoms, their onset, duration and severity, previous menstrual cycles. History of weight gain or loss, stress, exercise habits, acne, hirsutism, alopecia, deepening of voice, pelvic pain, discharge, fever, headache, disturbance in vision, galactorrhoea, hot flushes, vaginal dryness , loss of libido, polyuria, polydipsia, numbness or tingling sensation of limbs, fatigue was taken.

Obstetric history, past medical history, surgical history, treatment history and family history was asked in detail. Patient underwent detailed general physical and systemic examination .Relevant investigations were done and recorded in the predesigned Performa.

Data Analysis
Results obtained were subjected to statistical analysis at the end of study using appropriate software like SPSS (statistical package for social sciences). The descriptive statistics were calculated for the background variables and causes for oligomenorrhoea and secondary amenorrhoea.

Result and Discussion

Total 250 patients who met the inclusion criteria were included in the study population during the study period. 200 patients had Oligomenorrhoea and 50 patients suffered from Secondary Amenorrhoea. The distribution of the study population was as follows:
GROUP A: Oligomenorrhoea Group: 200 patients
GROUP B: Secondary Amenorrhoea Group: 50 patients

Table 1: Distribution of Group A study population according to age (N=200)

Age Distribution (In Years)	No. of Patients	Percentage
20-25	60	30%
25-30	50	25%
30-35	64	32%
35-40	26	13%

Most of the study population belonged to **30-35 years** age group (**32%**) followed by **20-25** years age group (**30%**). The mean age of Group A **31.46±3.508 years.**

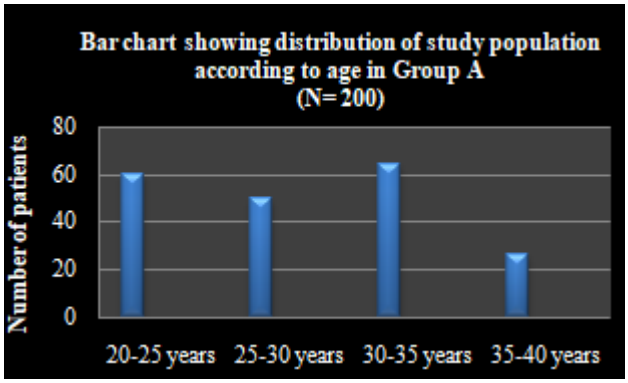

Figure 1: Distribution of the study population according to age: Group A(N=200)

Table 2: Distribution of the causes of Oligomenorrhoea– Group A (N=200)

Broad causes	Individual causes	No. of patients	Percentage (%) of individual causes
Hypothalamic and Pituitary Causes (n=22) (11%)	Functional Hypothalamic amenorrhoea	10	45.45
	Mental Depression	1	4.54
	Hyperprolactenemia	11	50
Ovarian Causes (n=85) (42.5%)	PCOS	75	88.24
	Premature Ovarian Failure	10	11.76
Uterine (n=42) (21%)	Post Uterine Curettage	22	52.38
	Tuberculosis	20	47.61
Drug Induced (n=26) (13%)	OCP	21	80.75
	DMPA	3	11.54
	Antipsychotics	2	7.6
Thyroid Disorders (n=25) (12.5%)	Hypothyroidism	23	92
	Hyperthyroidism	2	8

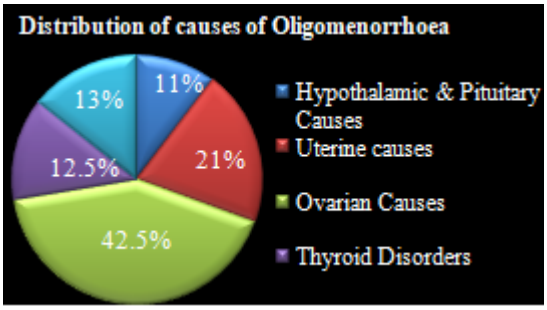

Figure 2: Distribution of Oligomenorrhoea among study population (N=causes of 200)

Ovarian factors were mostly responsible foroligomenorrhoea (**42.5%**), the commonest being Polycystic Ovarian Syndrome (**88.24%**) followed by Premature Ovarian Failure (**11.76%**).
Second most common cause of Oligomenorrhoea was the uterine factors (**21%**). Among the uterine causes, Post Uterine Curettage (**52.38%**) and Tuberculosis were found to be uniformly distributed (**47.61%**).

Oral Contraceptive Pills were the most common offending agent (**80.77%**) in patients with drug induced Oligomenorrhoea. Rest were due to DMPA (**11.54%**) and antipsychotics (**7.69%**).

Among the hypothalamic and pituitary causes leading to Oligomenorrhoea, most were functional (**45.45%**) followed by hyperprolactenemia (**50%**) and Mental Depression (**4.54%**).

Among the Thyroid disorders, majority of the patients were found to have hypothyroidism (**92%**).

Table 3: Distribution of the study population according to age: Group B (N=50)

Age Distribution (In years)	No. of Patients	Percentage
20-25	16	32%
25-30	12	24%
30-35	17	34%
35-40	5	10%

Most of the study population belonged to **30-35 years** age group (**34%**) followed by **20-25 years** age group (**32%**). Mean age of the group was **31.86±3.009** years.

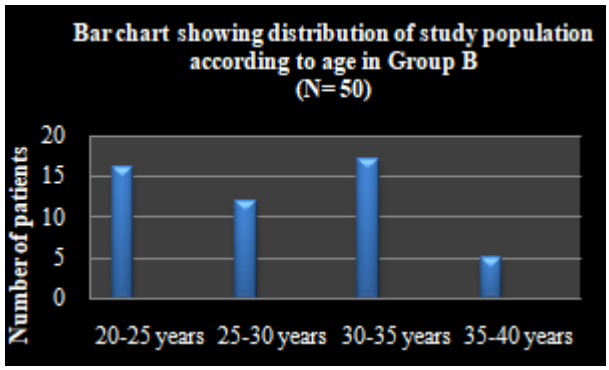

Figure 3: Distribution of the study population according to age: Group B (N=50)

Table 4: Distribution of causes of Secondary Amenorrhoea among the Study Population (N=50)

Broad causes	Individual causes	No. of patients	Percentage (%) of individual causes
Hypothalamic and Pituitary Causes (n=6) (12%)	Functional Hypothalamic amenorrhoea	03	50
	Mental Depression	01	16.67
	Hyperprolactenemia	02	33.33
Ovarian Causes (n=23) (46%)	PCOS	20	86.96
	Premature Ovarian Failure	03	13.04
Uterine (n=8) (16%)	Post Uterine Curettage	03	37.5
	Tuberculosis	05	62.5
Drug Induced (n=8) (16%)	OCP	06	75
	DMPA	01	12.5
	Antipsychotics	01	12.5
Thyroid Disorders (n=5) (10%)	Hypothyroidism	04	80
	Hyperthyroidism	01	20

Ovarian causes were the most common reason leading to Secondary Amenorrhoea(**46%**). Among the ovarian causes the most common cause was Polycystic Ovarian Syndrome (**86.96%**). Rest was found to have Premature Ovarian Failure (**13.04%**). Among the Uterine causes (**16%**), Post uterine curettage (**37.5%**) and Tuberculosis (**62.5%**) were found to be equally distributed.

Among the drug induced causes (**16%**) of Secondary Amenorrhoea, Oral Contraceptive Pills were the most common offending agent (**75%**). Followed by antipsychotic drugs (**12.5%**) and DMPA (**12.5%**).

Among the hypothalamic and pituitary causes (**12%**) , most were functional (**50%**) followed by Mental Depression (**16.7%**) and hyperprolactinemia (**33.3%**).

Among the Thyroid disorders (**10%**) most were found to have hypothyroidism (**80%**).

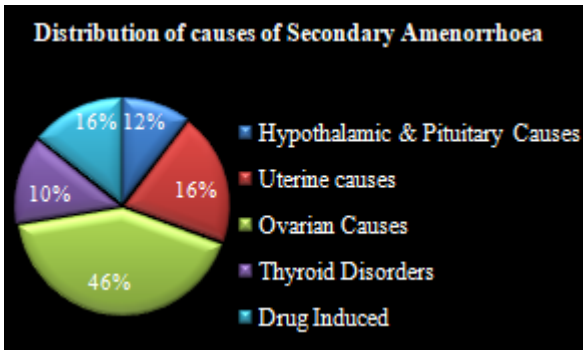

Figure 4: Distribution of causes of SecondaryAmenorrhoea Group (N=50)

Data Comparing the Parameters Between Group A and Group B

Table 5: Comparative Analysis of significant parameters between Group A and Group B

Parameters	Oligomenorrhoea patients (n=200)	Amenorrhoea patients (n=50)	P Value (significant if <0.005)
Mean Age (years)	31.46±3.508	31.86±3.009	P=0.461
Mean BMI(kg/m^2)	22.46±2.84	21.78± 3.68	P=0.001
Number of patients with Hypothalamic-Pituitary cause	22(11%)	6 (12%)	P=0.976 Chi square value=3.784
Number of patients with Ovarian causes	85(42.5%)	23(46%)	
Number of patients with Uterine cause	42(21%)	8(16%)	
Number of patients with Drug Induced cause	26(13%)	8(16%)	
Number of patients with Thyroid Disorders	25(12.5%)	5(10%)	

Chi square analysis suggests **no significant difference** in diagnosis of subjects.

Oligomenorrhoea and amenorrhoea are essentially similar symptoms with identical causes—the difference is only in the degree of dysfunction. If left untreated, patients with oligomenorrhoea may end up having secondary amenorrhoea and complications associated with primary pathology.

Oligomenorrhoea and Secondary Amenorrhoea have both short term and long term implications in a women's reproductive and physical health. The present study has shown that Polycystic Ovarian Syndrome is a major cause of oligomenorrhoea and secondary amenorrhoea. Patients with PCOS not only have fertility issues but also progressively deteriorating metabolic disorders. This study emphasizes the need to seek medical help in case of menstrual irregularities so as to identify disorders like PCOS in patients with oligomenorrhoea and secondary amenorrhoea early for restoration of fertility as well as control of metabolic parameters with special emphasis on Insulin resistance.

Drug induced oligomenorrhoea as well as secondary amenorrhoea also needto be addressed. The present study has found Oral Contraceptive Pills to be a major offending agent leading to these two menstrual disorders. Young couples need to be properly counseled regarding the possibility of these menstrual abnormalities. However, care has to be taken so that demotivation towards contraception is not promoted.

The present study also emphasizes the urgency to diagnose subclinical or clinical hypothyroidism in patients with oligomenorrhoea or amenorrhoea. Hypothyroidism is one of the preventable causes of infertility in patients with menstrual abnormalities.

4. Limitations

The limitations of this study are as follows:

- The study design of this study is Cross-sectional which may have falsely implicated some of the inferences
- Like any Hospital-based study, the present study has Sample Selection Bias.
- No blinding has been done for the present study and so Observer and Analysis bias may have crept in.
- No Control population has been selected. Comparing the clinical and laboratory parameters may have yielded a better comparison and led to a more statistically valid conclusion.
- Hysteroscopy was not available for diagnosis of uterine causes, specially Asherman's syndrome which was diagnosed by hysterosalpingography.

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