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ECONOMIC EVALUATION OF HEALTH CARE INTERVENTIONS: A PHARMACOECONOMIC STUDY

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ABSTRACT

Aim: A Survey on impact of anaemia on menstruation and dietary intake of Adolescence girls attending secondary government school.

Objectives:

- To improve the quality of life of adolescents girls in govt. Schools.
- To determine the prevalence of anaemia among vegetarians and non-vegetarians in adolescent girls.
- To decrease or reduce the risk of anaemia due to menarche in adolescent.
- To improve the quality of life in adolescents according to their dietary intake.

Methodology: Ambispective study with a sample size of 354 subjects conducted in secondary government school for a period of 2 years [2016-2017 data collected]. **Results:** Based upon the analysis the total number of 354 students. In that, Number of students who are menarche [2016-190 and 2017-246] are regular. Whereas, [2016-69 and 2017-40] are irregular. According to diet, [2016-227 and 2017-222] are normal. Whereas, [2016-127 and 2017-131] are abnormal. As Hemoglobin, in [2016-83 and 2017-150] are low. Whereas, [2016-246 and 2017-187] are moderate. And [2016- 25 and 2017-17] are severe. **Conclusion:** As compared the results of secondary government school among Adolescents girls in 2016-17. As menarche regularity and irregularity was improved in 2017. And Diet was not improved in 2016 and 2017. And hemoglobin, was improved in 2017.

KEYWORDS: Pharmacoeconomics, Medication errors, medication reconciliation.

INTRODUCTION

ANAEMIA

Definition: Anaemia is said to be present when the haemoglobin level in the blood is below the lower extreme of the normal range for the age and sex of the individual.[2]

Normal haemoglobin range according to age.[2]

Age group	Hb (Range in gm/dl)
Newborn (< 1 week old)	14-22
6 months old	11-14
Children (1-15 yrs)	11-15
Adults-men	14-16
Women	12-16

Anaemia is a condition in which the number of red blood cells and consequently their oxygen-carrying capacity is insufficient to meet all the body's physiologic needs which are vary with a person's age, gender, altitude, smoking and different stages of pregnancy.[10]

Iron deficiency is thought to be the most common cause of anaemia globally, but some other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and chronic inflammation, parasitic infections, and inherited or acquired disorders can cause anaemia.[10]

Anaemia is estimated to contribute to more than 115,000 maternal deaths and 591,000 prenatal deaths globally per year. Anaemia is very high (ranging between 80~90%) in preschool children, adolescent girls pregnant and lactating women. There are about 1.2 billion adolescents in the world, which is equal to 1/5th of the world's population and their numbers are increasing.[10]

ADOLESCENTS

Adolescence (10-19 years of age) is critical period of life characterized by significant changes like increasingly pulsatile secretion of gonadotropins, change in body contour and development of brain (prefrontal cortex, improved connectivity of various networks). These changes (adrenarche, thelarche, menarche, growth spurt) are more marked in early phase(10-14 years) and further consolidated in its late part(15-19 years) marking a paradigm shift in the pattern and style of life.[1]

Menstrual cycles become predominantly ovulatory within 8-12 years of menarche. 4 Pattern of menstruation may not be regular, menstrual blood loss may be excessive adding to stress and causing compromised quality of life.[1]

Irregularity of newly initiated menstrual cycle, a common occurrence in adolescents, is largely attributed to immaturity of hypothalamic pituitary ovarian axis. Anovulation is the most frequent physiological cause of heavy and prolonged periods.[1]

Other causes are stress, eating disorders, thyroid dysfunction, diabetes mellitus, bleeding disorders etc. Menorrhagia and polymenorrhagia is a risk factor for development of anaemia in adolescents in addition to other causes like worm infestation, poor socio-economic status, dietary habits etc prevalence of excessive menstrual bleeding in <1-18% adolescents. Anaemia affects 30% women worldwide.[1]

The anaemic adolescent girls enter into adulthood with poor general health and little resistance to infections and low threshold to develop serious morbidity as a result of even mildly excessive blood loss in labor.[1]

In India 74% of children and over 50% of adolescent girls and women of reproductive age are anaemic.[7]

Adolescence being the phase of rapid growth, has an increase demand for iron requirement in both boys and girls but more so in girls because of menstruation. Anaemia not only affects the present health status of girls but also has deleterious effects in future pregnancy, that puts the women at three times greater risk of delivering low birth weight and 9 times higher risk of perinatal mortality, thus contributing significantly for increased infant mortality rate and 30% maternal deaths.[7]

Adolescence is a period of maturity, a point of physical, emotional, social and psychological change. It is considered to be the period between ages 13 and 19. This includes 35 per cent girls of 15-19 years of age.[4]

The pattern of menstrual cycle will have a significant impact on a girl's reproductive life, which raises a concern for the patient and their familie.[4]

The age of menarche is determined by general health, genetic, socio-economic and nutritional factors. The mean age of menarche is typically between 12 and 13 years.[4]

The initial cycles after menarche are often irregular with a particularly greater interval between first and second cycle.

The early menstrual cycles are thought to be anovulatory, with frequency of ovulation being related to time since menarche and age at menarche.[4]

Most normal cycles range from 21 to 45 days, despite variability even in the first gynaecologic year, although short cycles of fewer than 20 days and long cycles of more than 45 days may occur By the third year after menarche, 60% to 80% of menstrual cycles are 21 to 34 days long, as is typical of adults.[4]

Menstrual problems are generally perceived as only minor health concern and thus irrelevant to the public health agenda particularly for women in developing countries who may face life threatening condition.[4]

METHODS

It is Ambispective Observational Study conducted in Government schools for about a period of 2 years with a sample size of of 356 students were taken and evaluation for anemia ,dietary intake and menarche are done.

RESULTS

Anemia is the most prevalent nutritional problem worldwide and it's prevalence is highest in adolescent girls, particularly in menarche girls.

The main aims and objectives of our study is to improve the quality of life of the adolescent girls mainly in government schools by reducing the risk of anemia due to nutritional deficiency (insufficient dietary intake due to financial problems) and menarche problems (irregularity, over bleeding, etc.,). By this study we can improve the dietary modifications, which may improve the health and overcome other menarche problems in adolescent girls.

It is an Ambispective study with a sample size of 354 adolescent students of a government school of 5 different classes. In this study a survey conducted in which the physical examination, Haemoglobin levels, dietary conditions and menarche conditions of the subjects were collected of two following years (2016 and 2017).

The data was analysed for prevalence of anemia and severity. The data of anemia, dietary, menarche was compared between 2016 and 2017 years in adolescent girls.

The analysed data concludes that the severity of anemia was found to be more among the students who were more than 13 years.

From the data analysed the severity of anaemia was decreased in 2017 compared to 2016. It is seen more in adolescent girls above age 13years. The Haemoglobin percentage was increased in 2017 it is 23%(83) at lower stage of anaemia, 69%(246) at moderate stage of anaemia and 7%(25) at severe stage of anaemia than 2016 it is 42%(150) at lower stage of anaemia, 52%(187) at moderate stage of anaemia and 4%(17) severe stage of anaemia.

The class wise analysed data based on menarche concludes that the regularity of menarche increased as increasing the age in adolescent girls. In 2016 26% irregular students are found and 14.2% irregular students are found in 2017.

The dietary intake of adolescent girls was found to be abnormal. In 2017 38%(131) adolescent girls are consuming abnormal diet in their daily routine. And according to 2016 dietary data it is 35% (127).

Based on these conditions it is concludes that the abnormal dietary intake may cause problems in regularity of menarche and other menarche problems which may lead to anaemic conditions in adolescent girls.

DISCUSSION

- A study of anaemia on menstruation and Dietary intake of Adolescents in secondary school. Mainly anaemia is an important health issue throughout the world with the highest prevalence rate and contribute more than 1,15,000 maternal deaths and 5,91,000 prenatal deaths.
- Globally, per year about 80-90% out of billion populations, 21% adolescents are affected. Menstruation, quite a lot of blood is lost from menstruation and consequently a lot of iron in the form of haemoglobin is lost. Women who do not take iron intake as supplement during menstruating years can become anaemic.
- Dietary intake of fast food and junk food may cause many complications in the future such as obesity, T2DM, Heart disease, Atherosclerosis, HF, HTN, malnutrition etc. According, to WHO anaemia with menstrual history has reported more in females [70%]. The dietary modification may improve the health and increase iron sufficiency in these group of Peoples.
- In this study, a total number of students in secondary government school were found to be 354. Among 354, 6% from 6^{th} class, 14% from 7^{th} class, 20% from 8^{th} class, 29% from 9^{th} class, 31% from 10^{th} class. Of which 23 students from 6^{th} class are 11 yrs. Among this 23, 1% was mechure, 20% are Non veg, 3% Are veg, 8% has moderate Hb, 15% has mild Hb, And 1% have regularity with duration of More than 5 days. 50 students from 7^{th} class of 12 yrs. Among this 50, 20% was mechure. 42% are non veg, 8% are veg, 29% has moderate Hb, 18% has low Hb, 3% are severe. And 15% have regularity with a duration of 5 days whereas 5% with irregularity of 3 days.
- 72 students from 8^{th} class of age 13 yrs. Among this 50, 55% are mechure, 42% are non-Veg, 8% are veg, 38% has mild Hb, 32% has moderate Hb, whereas the 46% have regularity with duration of 5 days and 9% with irregularity of 1 month. 104 students from 9^{th} class of age 14 yrs. Among this 104, 99% are mechure, 10% are non-mechure, 93% are non veg, 11% are veg, 56% has mild Hb, 46% has moderate Hb, 2% are Severe. And 86% has regularity with a duration of 5 days.14% has irregularity with a duration of 1 month. 105 students from 10^{th} class of age 15 yrs. Among this 105, 105 are mechure, 85% are non Veg, 20% are veg, 21% has mild Hb, 71% has moderate Hb, 13% are severe. And 93% has regularity with duration of 4-5 days, 12% are of irregularity with duration of 1 month or rarely. 3 months.
- This study provides an indication to initiate the anaemia prophylaxis, Menarche, for adolescent's girls including nutrition education in school. Based upon the analysis the total number of 354 students. In that, Number of students who are menarche (2016-190 and 2017-246) is regular. Where's (2016-69 and 2017-40) are irregular. According to diet, (2016-227) and (2017-222) are normal. Whereas, (2016-127 and 2017-131) are abnormal. As, haemoglobin in (2016-83 and 2017-150) are low. Where's (2016-246 and 2017-187) are moderate. And, (2016-25 and 2017-17) are severe.

LIMITATIONS OF THE STUDY

Random selection of patients was done in our study. So, the results cannot be generalized to all the patients admitted in the ER, as many cases might have been missed during night shifts.

CONCLUSION

The present Ambispective study was based on comparison of anaemia, dietary intake and menarche conditions in adolescent girls.

From the data analyzed the severity of anaemia was decreased in 2017 compared to 2016. It is seen more in adolescent girls above age 13years. The hemoglobin percentage was increased in 2017 it is 23% at lower stage of anaemia, 69% at moderate stage of anaemia and 7% at severe stage of anaemia than 2016 it is 42% at lower stage of anaemia, 52% at moderate stage of anaemia and 4% severe stage of anaemia.

The class wise analyzed data based on menarche concludes that the regularity of menarche increased as increasing the age in adolescent girls.

The study concludes that a majority of the girls had clinically obvious nutritional efficiency diseases. Problems related to menstruation, dietary intake are quite frequent and often result in the interruption of the daily routine of the adolescent girls, therefore it is important that school officials and school health programme staff recognize these problems and need to be sensitive to their problems. Further studies should be performed to determine the reason for this trend, and newer strategies need to be employed.

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