

## Correlating Age of Menarche, Coitarche and First Conception

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### Keywords

Menarche, coitarche, primigravida, conception

### Abstract

Reproduction is an important characteristic of life. Although a common and important feature of living organisms, it has varying characteristics in different species and among different races in the same species and even in the same family among successive generations. Also the onset of reproductive age and longevity of reproductive age is dependent on the gender. Males mature a bit later compared to female. This study was conducted in Dhiraj hospital to ascertain the relationship between the age of menarche, age of coitarche and age of first conception. At the end of the study we found that the early menarche is associated with high fertility as suggested by lesser gynaecological age before conception.

### 1. Introduction

There are several characteristics of a living organism. Most of the characteristics are present in living since birth, but the maturation and functioning of reproductive tract starts after attaining certain age. The first menstrual bleeding, menarche, is the best recorded female pubertal milestone defining the beginning of ovulation and fecundity. In human beings it is varying between 7 years to 17 years. Majority of female human population in India entering reproductive age between 11 and 13 years. Again it is noteworthy that in female the reproductive years have early onset and shorter reproductive age compared to male.

### 2. Review of Literature

Menarche is defined as the first menstrual period in a female adolescent. Menarche typically occurs between

the ages of 10 and 16, with the average age of onset being 12.4 years. Menarche occurs on maturation of hypothalamic-pituitary-ovarian (HPO) axis and depends on normal hypothalamic and pituitary function, normal female reproductive anatomy, normal nutrition, and the absence of other chronic illnesses. The kiss1 gene, which produces kisspeptin, and its receptor G protein-coupled receptor 54 (GPR54) are necessary for normal reproductive function. Kisspeptin and GPR54 are expressed in hypothalamic gonadotropin-releasing hormone (GnRH) neurons. The hypothalamic kiss1 system relays metabolic information to the gonadotropic axis. Circulating estradiol activates kisspeptin, which in turn activates GnRH neurons. Puberty is initiated when GnRH is secreted in a pulsatile manner by hypothalamic neurons. Pulsatile release of GnRH, and thus, LH and FSH, is necessary for puberty and menarche. The onset of female puberty is marked by thelarche (breast budding),

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which typically occurs after eight years of age. Thelarche is followed by pubarche (pubic hair development), growth spurt, and finally, menarche. Immaturity of the HPO axis during the early years after menarche is responsible for irregular and infrequent ovulation and irregular periods. Within third year after menarche, 60-80% of menstrual cycles are 21 to 34 days long, typical of an adult cycle. In females who undergo early menarche, 50% of their cycles are ovulatory in the first year, and nearly all are ovulatory by the fifth year post-menarche. In contrast, it takes approximately 8 to 12 years for all cycles to be ovulatory in females who experience a late menarche.<sup>[10]</sup> Earlier onset of menarche was seen in those surrounded by stressful family environments, those in foster care, and those living with a stepparents and those raised in urban environment. Adolescents from families of high socioeconomic status (SES) experience menarche at an earlier age when compared to those from families of a lower SES.<sup>[18]</sup> Those who consumed more animal protein and less vegetable protein between the ages of three to five experienced earlier menarche.<sup>[19]</sup> Overweight or obese BMI is a risk factor for early menarche. Formula feeding during early infancy is also considered as a potential factor for early menarche.<sup>[22]</sup>

Adolescent having early menarche may face physical and psychosocial problems, including anxiety and depression. Earlier sexual intercourse, substance use, and suicidal tendencies are quite common in early onset menarche adolescents. Females who have early menarche are more vulnerable to early pregnancy, sexually transmitted infections, and sexual violence.<sup>[24]</sup> Early menarche has been associated with earlier age at first sexual intercourse (3–7). One possible mechanism in which early menarche may result in earlier age at first sexual intercourse is increased release of sex hormones at puberty increases libido leading to early intercourse or marriage. Early development of secondary sex characters attract males providing instinct for early sexual intercourse and marriage. Girls who experience menarche at younger ages may appear older, have older friends, and be more likely to engage in negative behaviors such as missing school, smoking, and drinking (8–11). The younger the age at first menstrual period and first sexual intercourse, the longer the interval young women will potentially spend at risk of pregnancy.

**Late Menarche** :Primary amenorrhea is the term used to describe the absence of menses by age 15 in the setting of normal growth and secondary sexual development or the absence of menses by age 13 in the absence of normal growth or secondary sexual development. Menarche can be delayed in adolescents with very low body mass due to starvation, malabsorption, or an eating disorder such as anorexia nervosa. Intense exercise of at least two hours per day delays puberty and, therefore, menarche.<sup>[29]</sup>

## Time to pregnancy

Woman is most fertile at the time of ovulation (when an egg is released from your ovaries), which usually occurs 12 to 14 days before your next period starts. This is the time of the month when she is more likely to become pregnant.

The onset of menstrual cycles marks the onset of functioning of the reproductive system. Although initial cycles may be anovular for first two to three years, the changes of puberty keep developing to achieve maturation. The term coitarche is assigned to the age of first sexual intercourse while gynecological age represents coitarche minus age of menarche. Females with early onset of menarche are usually having high fertility compared to those having late menarche.<sup>[1]</sup> Fecundability is now commonly measured as waiting time to pregnancy (TTP). The number of months or cycles taken by a sexually active couple, not using birth control methods to conceive, is considered as the fecundability.<sup>2</sup> It could be due to effect of sex hormones, schism between physical development and psychological maturity and genetic factors. We know that germ cells have a property of apoptosis and degeneration. At the birth around 2 million primary oocytes are there out of which only about 400 mature during the reproductive life of a woman. On maturation of ova, the graffian follicle produces oestrogens under influence of rising FSH, while corpus luteum produces progesterone after the rupture of graffian follicle. Cyclical production of these two hormones regulates the uterine endometrial cycle and menstruation. The no of primary oocytes and their regular healthy maturation may trigger early menarche and regular ovulation immediately after menarche. early menarche and regular ovulation associated with higher levels of sex hormones will promote physical as well as psychological maturation. Such an adolescent may have early coitarche.

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subsequent to regular ovulation and physical maturity such girls conceive easily and earlier after marriage.

## AIMS AND OBJECTIVES

To ascertain the average age of menarche in the antenatal patients attending the DHIRAJ HOSPITAL.

To determine the average interval between the marriage and first conception.

To determine any relation between early menarche and higher fertility.

To assess the relationship between age of menarche and the time elapsed for conception after marriage.

## 3. Material and Methods

The study was conducted in Dhiraj hospital a tertiary care centre located in the rural area of Baroda district catering maternal and child health services. It was a questionnaire based study. The study period extended from jan22 to dec 22. It was a questionnaire based study involving various parameters. Age at menarche was self-reported, and early menarche was defined as age 10 years or younger<sup>3,4</sup>. Age at first conception was calculated from the patient-reported date of the last menstrual period and verified by ultrasound examination.<sup>5</sup> Body mass index was used to assess prepregnant body size and was computed as self-reported prepregnant weight in kilograms divided by measured height<sup>2</sup> in meters,<sup>6</sup> and trichotomized as under-, average, and overweight.<sup>7</sup> The data collected was kept secret. To maintain the dignity of woman and decency of the study, marriage date was taken as the date of coitarche.

## INCLUSION CRITERIA

The primigravidae patients attending the antenatal clinic of Dhiraj hospital.

The pregnant women who had minimum literate up to up to 7th standard.

The pregnant women who were sure of their menarche.

Patients knowing exact last menstrual date during the antenatal phase.

Patients married in legal marriage age and sure of their marriage date ( coitarche)

## Exclusion criteria

The patients who were not sure of their age, marriage date or the LMP

The patients with h/o premarital sexual relationship.

The women having medical disorders and endocrine disorders e.g. DM type 1

The patients who had started menstruation after medical intervention.e. g. imperforate hymen or septum in vagina

The patients who had conceived after assisted reproductive techniques.

The patients not willing to participate in the study.

## Observation and results:

During the study period 2164 primigravidae patients were reported for the antenatal care, out of which 1885 satisfied our inclusion criteria and were included in the study. At the end of the study period the data collected was analysed which yielded following results

**Table 1:** Age of Menarche

Sr no	Age of menarche	No of women
01	07 years	03
02	08 years	12
03	09 years	46
04	10 years	217

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05	11 years	628
06	12 years	573
07	13 years	207
08	14 years	86
09	15 years	72
10	16 years	29
11	17 years	12

**Table 2** Average age of marriage

Sr no 1	AGE OF MENARCHE	AVERAGE AGE AT MARRIAGE	NO OF WOMEN	
01	07 years	18.2	03	
02	08 years	18.8	12	
03	09 years	19.5	46	
04	10 years	19.3	217	
05	11 years	20.6	628	
06	12 years	21.8	573	
07	13 years	18.4	207	
08	14 years	20.7	86	
09	15 years	21.9	72	
10	16 years	20.1	29	
11	17 years	22 YEARS	12	

**Table 3** SOCIO ECONOMIC STATUS OF PARTICIPANTS

	Socio economic class	No pf participants	Early menarche <11 years	Late menarche >13 years
01	low	184	17	38
02	Lower middle	1167	136	234
03	Upper middle	313	92	33

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04	Upper	221	81	12
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**TABLE 04** LITERACY LEVEL OF PARTICIPANTS

SR NO	EDUCATION	NO OF PARTI
01	Std 7 to12	618
02	Up to graduation	1224
03	Post graduates	43

**TABLE 5** CORRELATING MENARCHY WITH COITARCHE

SR NO	AGE OF MENARCHE	AGE OF COITARCHE	GYNAECOLOGIC AGE
01	07 TO 10 YEARS	18.5 YEARS	9.8 years
02	11 TO 14 YEARS	20.1 YEARS	8.9 years
03	14 TO 17 YEARS	21.5 years	8.1 years

**TABLE 6** CORRELATING AGE OF MENARCHE WITH MARRIAGE TO CONCEPTION INTERVAL

SR NO	AGE AT MENARCHE	MARRIAGE TO CONCEPTION PERIOD
01	7 TO 10 YEARS	1.1 YEARS
02	10.TO 14YEARS	1.4 YEARS
03	14 TO 17 YEARS	1.9 YEARS

**TABLE 07** CORRELATING COITARCHE WITH MARRIAGE TO CONCEPTION PERIOD

SR NO	AGE AT COITARCHE	MARRIAGE TO CONCEPTION TIME

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01	18.6YERS	1.6 YEAR
02	20.4	2.1 YEARS
03	21.7 YEARS	2.4

## 4. Discussion and Results

As is well known the age of menarche is closely related to the age of coitarche and first conception after marriage after marriage. Early maturing females tend to conceive at younger age than late maturing females<sup>1-4</sup>. It can be ascribed to effect of circulating sex hormones, rapid physical development and psychological maturity<sup>5-13E</sup>. Average age of menarche in tropical countries is considered to be ranging from 11 to 13 years. Menarche before 11 years can be considered as early menarche. Table 1 shows the age distribution of menarche in our study. 278 or 14% of women reported early menarche in our study. 199 or 10.55% of patients reported late menarche. 1480 or 78.52 participants were from upper middle class and upper class family. 1267 or 67% subjects were well educated. Table 5 correlates age of coitarche with the age of menarche. It is very much evident that age of coitarche is closely related to the age of menarche. Table 6 shows the relation of fecundity with the age of menarche. Fecundity is found to be higher in women having early menarche.

CONCLUSION FROM THE above study we can conclude that girls from the upper middle class and upper class who are well nourished having robust body with high BMI have early menarche and they mature early menarche and their fecundity is reasonably more compared to girls having late menarche. The girls having early menarche conceive earlier. (They have shorter TTP). Thus girls with early menarche have shorter gynaecological age and shorter TTP.

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