# Menarche and Fertility : A Correlation Study Among The Gond Tribe of Maharashtra

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ABSTRACT An attempt has been made to assess the effect of menarcheal age on fertility among Gond, a tribe of Maharashtra. It has been found that the average menarcheal age among Gond is 13.69±0.24. The menarcheal age indicates the upward trend in the premenopausal women. The adolescent sterility suggests a inverse correlation with the menarcheal scale, while the relationship between the fertility and menarche is parabolic. The value of co-efficient of correlation *i.e.* r = 0.656±0.06 between the menarcheal age and fertility is significantly high. Thus, it suggests that variation in the onset of menstrual cycle is one of the factor responsible for differential fertility.

## INTRODUCTION

In female the age at which the first manstruation occurs *i.e.* age at menarche is widely considered as an important land mark in the sexual maturity. It is also an important event in the physiological life of a female. It has been observed by number of investigators that there is a wide variation in the age at menarche. Mazer and Israel (1951) pointed out that menarche might normally appear any time during the period of transition from childhood to maturity occassionally as early as nine years after as late as sixteen years, depending upon racial, constitutional and environmental factors. Thus, the menarcheal age also constitute an important aspect of population dynamics. In India, a number of studies on age at menarche have been conducted in different region. The average menarcheal ages of Hindu women of Calcutta and Madras were first reported by Robertson in 1845. Since then many authors have reported the average age at menarche of various population of India (Curjel, 1920; Sen, 1953; Peters, 1957; Rakshit, 1960, 1962; Foll, 1961; Bardhan, 1965; Singh and Roberts, 1975; Rao and Aruna, 1976).

The variability is believed to be caused by the interaction of number of factors such as nutritional and socio-economic status (Michelson, 1944; Satyanarayan and Naidu, 1979), racial, environmental factors (Mazer and Israeli, 1951), climate and food habits (Bhardwaj and Virmani, 1971), urban/rural living (Wilson and Sunderland, 1950). Family size has also been known to effect the age at menarche, the girls with lesser number of sibs attain the menarche at an earlier age (Singh, 1972).

The period between the onset of menarche and menopause constitute the reproductive span for a female. Thus, the age at menarche can be used as a quantitative and objective measure of reproductive physiology and thus partially reflecting the biological capacity to reproduce. It have been reported that wide variation in menstrual cycle being responsible for differential fertility in women (Ghosh and Kumari, 1973).

In the present study an attempt has been made to assess the effect of menarcheal age on fertility in a tribal population *i.e.* Gond of Central India.

## MATERIAL AND METHODS

Data on menarcheal age and fertility were collected by interviewing 96 Gond women of Nagpur district of Maharashtra, all of them inhabiting the same ecological niche and

having similar socio-economic status. Out of 96 women, 22 have already crossed the menopausal age while the rest are yet to attain the manopause. Other demographic information relating to age at marriage, age at first and last birth were also collected. Generally it is a difficult task for ascertaining age in tribal populations but in the present study all possible efforts were made to verify the age.

The family planning methods are not very frequently used in the tribal population. However, the younger mothers aged between 20-30 years often used contraceptives. The women aged 40 and above have confirmed that neither they nor their husband ever adopted any family planning devices. therfore, these women were exposed to the risk to conceive throughout their married life and thus their reproduction may be considered to be natural.

## RESULTS AND DISCUSSION

The percentage distribution of pre and post menopausal women in different menarcheal age groups has been given in table 1. The highest percentage of women were observed to have first menstruation at the age of 13 in both pre and post menopausal groups. The average menarcheal age of the Gond women is 13.69±0.24. Montagu (1948) was of the opinion that the menarche before 12 years of age is abnormal. As such the frequency of abnormality in the present sample is very less *i.e.* 1.04%. There are numerous studies on the menarcheal age of the Indian women belonging to the caste populations from various parts of India, but the data on tribal populations are rather scanty.

The mean menarcheal age for the pre and post menopausal women are 13.80±0.21 and 13.59±0.26, respectively (Table 2). The difference between the two means is not statistically significant (t-value = 0.61), but it indicates the upward trend in the premenopausal group. Similar type of upward trend is also reported among the Brahman women of Maharashtra and that too of Nagpur district (Rakshit, 1962). On the contrary many investigations have pointed out that average menarcheal age is gradually going down in caste population (Michelson, 1944; Ghosh and Kumari, 1973).

**Table 1: Menarcheal age in pre and post menopausal women**

| *Age at menarche in year* | *Pre-menopausal* | | *Post-menopausal* | |
|---|---|---|---|---|
| | *No.* | *%* | *No.* | *%* |
| 11 | 1 | 1.35 | 0 | 0.00 |
| 12 | 8 | 10.81 | 2 | 9.09 |
| 13 | 23 | 31.08 | 13 | 59.09 |
| 14 | 21 | 28.38 | 2 | 9.09 |
| 15 | 10 | 13.51 | 3 | 13.64 |
| 16 | 6 | 8.11 | 1 | 4.54 |
| 17 | 5 | 6.76 | 1 | 4.54 |
| Total | 74 | 100.00 | 22 | 100.00 |

Besides, the age at menarche, the knowledge about the adolescent sterility period is equally important as it is also one of the factors contributing towards the differential fertility. The adolescent sterility refers to an interval between the menarcheal age and the age at first birth in those cases where the marriage took place before menarche. However, it is considered also from the age at marriage in cases where the menstruation occured before marriage and the age at first birth. In the present study the completely sterile women and those who have got married recently *i.e.* approximately 6 months before this investigation are not included for the calculation of adolescent sterility period. As shown in table 3 the period of sterility is the highest in the lowest menarcheal age whereas it is lowest in the highest menarcheal age group, thus exhibiting the inverse relation with menarcheal age.

**Table 2: Mean menarcheal age in pre and post menopausal women**

| | *Group* | *No.* | *Range* | *Mean ± S.E.* |
|---|---|---|---|---|
| 1. | Post-menopausal | 22 | 12-17 | 13.59 ± 0.26 |
| 2. | Pre-menopausal | 74 | 11-17 | 13.80 ± 0.21 |

**Table 3: Adolescent sterility and menarcheal age of Gond women**

| *Period sterility in year* | *Menarcheal age in years* | | | |
|---|---|---|---|---|
| | *11-12* | *13-14* | *15-16* | *17 and above* |
| 1 | 4 | 21 | 10 | 2 |
| 2 | 3 | 15 | 1 | 1 |
| 3 | — | 9 | 3 | 1 |
| 4 | — | 1 | 2 | — |
| 5 | 2 | 3 | 2 | — |
| 6 | — | — | — | — |
| 7 | — | — | — | — |
| 8 | — | 1 | — | — |
| 9 | 1 | 1 | 1 | — |
| 10 | — | — | — | — |
| 11 | — | — | — | — |
| 12 | — | 1 | 1 | — |
| 13 | — | 1 | — | — |
| 14 | — | 1 | — | — |
| 15 | — | — | — | — |
| Average sterility period | 3.83 | 3.00 | 2.40 | 1.75 |

**Table 4: Age at last birth in post menopausal women**

| *Age of the mothers at last birth in years* | *No.* | *%* |
|---|---|---|
| 15-18 | 2 | 9.09 |
| 19-22 | 1 | 4.54 |
| 23-26 | — | — |
| 27-30 | 5 | 22.73 |
| 31-34 | 2 | 9.09 |
| 35-38 | 9 | 40.91 |
| 39 | 1 | 4.54 |
| 40 | 1 | 4.54 |
| 41 | — | — |
| 42 | 1 | 4.54 |
| 43 | — | — |
| 44 | — | — |
| 45 | — | — |
| Total | 22 | 100.00 |

Whereas Makuda and Hori (1939) reported in Japanese women that the sterility rate is relatively low in the menarche of younger ones. But this rate is increased as the menarche is delayed. Especially the marked increase is proved in frequency in the sterile women who have later menarches than the age of 17 years''. Mazer and Israel (1951) supported Makuda and Hori's findings.

For calculating the age at last birth, only the woman who have attained the menopausal age have been taken into account as others are still capable of reproducing. Table 4 shows that most of the woman *i.e.* about 95.46% have completed their reproduction at the age of 40 years. The average age at the last birth is 32.30±1.49. Rakshit (1962) has also reported that the average age at last birth is 32.79±0.83 among the Brahman women of Maharashtra. For the purpose of comparison of fertility of women having different menarcheal age, the total number of pregnacies of all woman aged 40 years or above are considered on the basis of existing literature (Sen, 1953; Rakshit, 1962; Mukherjee, 1972). The age specific fertility of Indian women above 40 years is in general rather small. The women who have lost their husbands below the age of 40 have been excluded. Sterile women have not been taken into account. Consequently the figures obtained may not be true for the whole population. These figures merely give an idea of a sample of fertile mothers. Co-efficient of correlation between menarcheal age and fertility works out to be r=0.66±0.057

As the sample is small it has been grouped into three categories according to the menarcheal age as shown in table 5. Women who have attained menarche at either extreme of the menarcheal age scale have fewer pregnancies in comparison to those in the intermediate one. The average of fertility is significantly less in lower menarcheal age group than those in the higher menarcheal age groups.

## CONCLUSION

The adolescent sterility suggest inverse correlation with menarcheal scale. The relationship between the fertility and the

**Table 5: Reproductive performance of women aged above 40 years**

| *Age at Menarche* | *No. of Mothers* | *Average No of pregnancies* | *Average No. of deaths* | *Average live births* |
|---|---|---|---|---|
| 11-12 | 6 | (26) 4.33 | (5) 0.83 | (21) 3.50 |
| 13-14 | 22 | (134) 6.09 | (40) 1.81 | (94) 4.27 |
| 15 and above | 8 | (47) 5.87 | (15) 1.87 | (32) 4.00 |

menarcheal age is parabolic and is in agreement with the results already reported. This suggests that the women having menarcheal age between 13-14 years have higher fertility than those on either side of menarcheal scale and thus are at selective advantage. The value of co-efficient of correlation *i.e.* r=0.66±0.057 between the menarcheal age and fertility is significantly high. Thus, it suggests that variation in the onset of menstrual cycle is responsible for differential fertility. It has been proved that the increase in age is accompanied by some physiological change which subsequently has substantial effect on fertility (Talwar, 1967). With the increase in age at marriage there is reduction in birth rate. If this increase comes beyond the age range of 20-24 years; then the decline in fertility will be still higher because this group generally represents peak years of fertility and therefore every lost year in this age group reduces peak fertility years. The period of reproductive life is further shortened due to early menopausal trend (Rakshit, 1962). However, the age at menarche is not the only parameter which determine differential fertility but there are other factors too *e.g.* age at marriage, menopausal age, family planning practice, etc.

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