MENSTRUAL DYSFUNCTION IN INDIAN ATHLETES

By

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SUMMARY

Menarche and menstrual profile were compared in 50 Indian female athletes and 50 non-athletic female controls. The premenarche trained athletes had their menarche significantly delayed as compared to those athletes who commenced their training post-menarche. A significantly higher incidence of menstrual dysfunction was seen in athletes as compared to the control group. The female athletes with menstrual alterations had a lower mean percentage of body fat as compared with the other subjects. As the mileage per week increased, the incidence of oligo/amenorrhoea increased.

Introduction

In the early 1970's, a woman jogger was a curiosity. Today millions of women are running, over a million girls play hockey and more than one-third of high school athletes are females. We conducted a descriptive study of 50 Indian female athletes and compared them with 50 non-running control subjects so as to evaluate menstrual dysfunction in athletes and its relationship to the percentage body fat and daily mileage.

Material and Methods

Hundred women between the ages of 18 and 24 years were studied. Fifty of these were female athletes from various sports clubs of Bombay. The remaining 50 subjects (controls) were from our hospital staff who were similar in age and background to the female athletes. Both these group of subjects were made to answer a questionaire designed to elicit personal data, past and present sports activity, menstrual data and contraceptive use information. The percentage of body fat was estimated finally by use of the nomogram designed by Sloan *et al* (1970) which involved the measurement of skinfold thickness at two sites, namely suprailiac crest and triceps measured by the same individual with a caliper.

Results

TABLE I
Age at Menarche

	No.	Mean Age (yrs.)
Premenarche trained athletes	26	13.3
Postmenarche trained athletes	24	12.9
Control	50	12.8

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Of the 50 athletes reviewed, 26 had commenced their training prior to menarche and had a mean age of menarche of 13.3 years (Table I), while the 24 athletes who had commenced their training post-menarche had a mean age of menarche of 12.9 years. The controls had a similar mean age of menarche of 12.8 years.

TABLE II
Onset of Menarche/Menstrual Dysfunction Correlate in Premenarche Trained Athletes

	No.	Average menarche (years)
Amenorrhoea	2	16.5
Oligomenorrhoea	10	13.5
Normal cycles	14	12.7

As seen in Table II, of the 26 athletes who commenced their training prior to menarche, two subsequently presented with secondary amenorrhoea while 10 had oligomenorrhoea during their athletic training. The athletes with secondary amenorrhoea had a significantly delayed menarche at 16.5 years while the athletes with oligomenorrhoea had their average age of menarche at 13.5 years. In comparison the athletes with normal cycles had no delay in their menarche as compared to the control group.

On correlating the menstrual dysfunction with the daily mileage and percentage of body fat (Table III), it was found that amenorrhoeic athletes had the maximum mileage with an average of 25 kilometers run per day and the least percentage of body fat of 15%. In contrast the athletes who ran only 5 kilometers per day were found to have normal cycles and their percentage body fat (18.4%) was much higher than those who had menstrual alterations. The mean percentage body fat of the control group was 25.3%.

Twenty-two of the 50 athletes complained of dysmenorrhoea during those times of the year when they were not in athletic training. Eighteen of these 22 athletes felt that regular exercise alleviated their dysmenorrhoea, while none reported that their symptoms were aggravated. Thus exercise appears to have a beneficial effect on dysmenorrhoea.

Discussion

From the data presented it is apparent that there are marked differences in age at menarche, menstrual patterns, % body fat and exercise patterns among female athletes and controls. The premenarchally trained athlete was found to have a delayed menarche. These findings corroborate well with the study of Frisch *et al* (1981) who correlated premenarchal training with menarche. Frisch and her colleagues suggest that an altered lean fat ratio might be the key mechanism responsible for the delay in menarche in young athletes. Since it is thought that conversion of androgens to

TABLE III
Menstrual Dysfunction/Daily Mileage/% of body fat Correlate

	Number	Average km/day	Average % body fat
Amenorrhoeic	2	24	15
Oligomenorrhoeic	12	14.5	16.7
Hypomenorrhoeic	6	9.7	17.5
Normal cycles	30	5.1	18.4

% Body fat in controls = 25.3%.

estrogens occurs primarily in peripheral fat, an alteration in the lean fat ratio might produce significant changes in steroidal metabolism and thus in steroid feedback to the hypothalamic pituitary unit. Such changes could then affect reproductive function.

The frequency of menstrual dysfunction was positively correlated with the number of kilometers run per week. These findings compare well with the findings of Feicht *et al* (1978) who found that the frequency of amenorrhoea was positively correlated with the number of miles run per week ($p < 0.01$), ranging from 6% in those running the least to 43% in those running the most.

In conclusion, it appears that the severity of physical exertion as judged by the number of kilometers run per week, is directly proportional to the degree and incidence of menstrual dysfunction. There is probably no particular type of training, weight loss or percentage of adipose tissue that will induce oligo/amenorrhoea in every woman. Instead, every woman probably has a different oligo/amenorrhoea threshold which may be correlated to these and other currently unknown factors.

References

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