RELATIONSHIP OF THE MENARCHEAL AGE OF CITY-GIRLS WITH SOCIO-ECONOMIC FACTORS

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Abstract

Authors studied the menarche beginning and its relationship with socio-economic factors in the case of 10—18 years old Szeged (South Hungarian) girls, on the basis of data collected with status quo method. A total of 4963 city girls were questioned and the menarcheal age was analysed on the basis of 11 factors.

The median calculated with the probit analysis was found to be 12.68 years. The first menstruation showed monthly and seasonal fluctuation. There is relationship between the time of girls' first menstruation and the girls' order of birth, total number of sibs, number of living sisters, size of the place of birth regarding mothers and both parents, education and occupation of the mothers, resp.

The coincidence of the month of birth and month of menarche of the girls occured in 10.25%. The frequency of those whose menstruation was irregular even one year after puberty was 7%.

Key words: menarche, socio-economic factors, city girls.

Introduction

Data are at disposal for over 200 years regarding the physiological maturation of girls (Haller, 1775). At the beginning, observations restricted only to the determination of the time of menarche, in the past decades, however, the phenomenon has been studied in connection with the most varied factors. In Hungary the first larger sample was published in 1963 (Bottyán et al., 1963), comprising 7000 Hungarian girls. Today there are many observations and publications concerning the menarcheal age of the Hungarian girls. Nevertheless, neither in Hungarian, nor in foreign special literature, no examples are found in respect to the accomplishment of the collection of data besides six somatic characters expanded simultaneously to 24 socio-economic factors — firstly relating to family factors — in the case of a group of girls living in a well defined geographical region or within an administrative unit.

Therefore, we decided to perform detailed studies on the beginning of menarche and its connection with socio-economic factors, related to 10—18 year old girls living in the county of Csongrád.

Sample and methods

The reviewed results were achived within a larger research program, the detailed description of which has been reported earlier (Farkas et al., 1983).

Here, we only wish to mention that the data of 29,879 girls aged from 10—18 were collected between February 23, 1981 and February 10, 1984. The majority (16,679) of the girls are from the county of Csongrád, 4,963 of them live in Szeged.

The data collected with status quo and anomymous questionnaire method were evaluated by R-40 type computer using the Osiris program package. The median was determined with probit analysis.

The changes in body measures are not discussed here since they have already been reviewed in an earlier paper (FARKAS, 1983).

Results

BEGINNING OF MENARCHE. — From 4,963 girls the menarche took place in the case of 3,088 during the period of the collection of data. It occurred earliest at the age of 8 years — in one single case — and after 16 years of age in 4 cases.

Taking for a base that the normal time interval of the menarche beginning is between the years 9—16 — at least in the case of the Hungarian girls — (SAS and KOVÁCS, 1984), it could be determined that too early menarche occurred only in two cases and that too late occurred in the case of four girls.

MENARCHE-MEDIAN. — 12.68 years was obtained as median, the 95% confidency interval of which was 12.18—13.18 years. Considering our earlier collection of data from Szeged as well (FARKAS, 1962, 1969), the following medians were determined:

Year of the study	Sample size	Median
1958/59	841	13.20
1961	1469	13.03
1966/67	774	12.73
1981/82	4963	12.68

A decrease is observable compared to the earlier data, although its rate has significantly slowed down in the past 15 years.

MONTHLY AND SEASONAL DISTRIBUTION OF MENARCHE. — On the basis of the admitted data the most frequent occurrence of menarche was in the months January (13.05%), August (13.01%), June (10.38%) and July (9.45%).

Likewise, the months January and August were also found to be the highest frequency in an earlier study (FARKAS, 1962).

According to the survey in 1981/82, the menarche beginning was 27.55% in the winter months, this being 39.35% earlier (between 1958—1961) (FARKAS, 1962).

As one of the causes of this change it could be mentioned that during the last 20 years many people moved to Szeged, the migration was great. In Western Hungary the relative frequency of the menarche beginning in the winter months is lower (EIBEN and BODZSÁR, 1970), nevertheless, seasonal fluctuation can be observed there as well. This phenomenon had been described 50 years ago (ENGLE and SHELESNYAK, 1934), thus it is characteristic not only for the Hungarian girls.

As another cause, an observation could be mentioned according to which winter accumulation is characteristic only for the city girls (KOWALSKA et al., 1963) and Szeged can also be ranked among this settlement category. In our case, however, the correctness of this assumption can only be decided after we have evaluated the data of girls living in smaller country settlement.

Out of 3,088 girls 2,966 remembered the month of menarche, 122 girls — 5.9% of those menstruating — were only able to tell the year of menarche one-two years after its beginning. Without a doubt it refers to the insufficient level of the sexual education.

In the followings a review is given of the development of the girls' menarche median according to a few socio-economic factors. The results in this regard are summarized in Table 1.

BIRTH ORDER OF GIRLS. — In our sample the difference between the median of first and third born girls was 0.37 year, i.e. the third born girls start to menstruate about 1/4 year later than the first born girls (Table 1, I. row).

This does not seem to be a great difference. BODZSÁR (1975) obtained similar result in the case of girls from Székesfehérvár (town in Central Hungary), and EIBEN (1972) received dissimilar result for Western-Hungarian girls.

Mainly Hungarian data are at disposal concerning the correlation between birth order and menarche (BODZSÁR, 1975, 1977; EIBEN, 1972; FARKAS, 1980, 1982), nevertheless, connection between the two phenomena was also observed for German girls (RICHTER, 1980).

TOTAL NUMBER OF SIBS. — Here are observations for a long time in respect to the relatedness of the number of sibs and the time of puberty of girls (BOLK, 1923, 1926). Most of the authors take the position that number of sibs and the time of puberty of the girls are in close connection with each other, furthermore, that high correlation could be determined between them (ROBERT, 1977).

The median also increased in the case of girls from Szeged on the basis of the number of sibs (Table 1, 2. row). Between the median of those without any sibs and those having three ones the difference was 0.47 year.

NUMBER OF LIVING BROTHERS. — When taking only to brothers into consideration from the sibs, such a slight difference was obtained between the medians that no correlation could be presumed between the two factors on its base (Table 1, 3. row).

NUMBER OF LIVING SISTERS. — The difference was higher when considering only the number of sisters. The difference was 0.23 year between the median of those without any sisters and those having two, with the observation of a steady increase (Table 1, 4. row).

SIZE OF THE PLACE OF BIRTH OF MOTHERS. — There are no comparative data at disposal from other sources regarding the connection between the size of the place of birth of parents and the date of birth of their daughters

In case of girls from Szeged the median did not show a steady change in conformity with the number of inhabitants of the birth-place of the mothers. The difference between the median of the daughters of mothers born in the largest and smallest populated settlements was found only to be 0.10 year. At the same time, however, the lowest (12.27 years) median was found for daughters of mothers born in settlements with 50—100 thousand inhabitants and the highest (12.87 years) was found in the case of the 5—10 thousand populated settlements. Accordingly, the difference was 0.60 year corresponding to more than half a calendar year (Table 1, 5. row).

Table 1. Change of menarche-median in the case of various socio-economic factors

Studied factors		Total cases	Median	95 p.c. conf. interval.
1. Order of birth	First born	2860	12.67	12.59—12.74
	Second born	1550	12.65	11.92—13.38
	Third born	300	13.04	11.90—14.19
2. Number of sibs	No sibs	985	12.61	12.39—12.82
	One sib	2807	12.65	12.45—12.86
	Two sibs	743	12.74	12.28—13.19
	Three sibs	214	13.08	12.22—13.93
3. Number of living brothers	No brothers	2536	12.67	12.15—13.19
	One brother	1980	12.69	12.53—12.85
	Two brothers	307	12.66	12.07—13.26
4. Number of living sisters	No sisters	2666	12.63	12.55—12.71
	One sister	1809	12.70	11.57—13.82
	Two sisters	335	12.86	12.46—13.26
5. Size of mother's birth-place	100 000—200 000	2085	12.60	11.39—13.81
	50 000—100 000	222	12.27	11.86—12.68
	10 000— 50 000	635	12.69	12.42—12.97
	5 000— 10 000	564	12.87	12.09—13.65
	below 5000	1012	12.70	12.51—12.90
6. Size of father's birth-place	100 000—200 000	2137	12.68	10.25—15.07
	50 000—100 000	202	12.69	11.48—13.91
	10 000— 50 000	582	12.66	12.27—13.05
	5 000— 10 000	534	12.72	12.52—12.92
	below 5000	944	12.73	12.26—13.19
7. Size of both parents' birth-place	100 000—200 000	1176	12.59	9.75—15.34
	10 000— 50 000	138	12.79	12.01—13.57
	5 000— 10 000	147	12.62	11.98—13.26
	below 5000	350	12.93	12.71—13.15
8. Education of mother	Primary school studies unfinished	242	12.88	12.57—13.19
	Primary school	1773	12.73	12.64—12.82
	Trained for skilled work	465	12.61	12.43—12.79
	Secondar school	1788	12.65	12.52—12.79
	College or University	612	12.59	11.29—13.89
9. Education of father	Primary school studies unfinished	220	12.76	12.29—13.23
	Primary school	1512	12.74	12.55—12.93
	Trained for skilled work	708	12.52	11.88—13.17
	Secondary school	1408	12.70	12.00—13.39
	College or University	945	12.65	12.30—13.00

Table 1. cont.

10. Occupation of mother	Industrial manual worker	667	12.82	12.35—13.28
	Other manual worker	1467	12.68	12.38—12.97
	Intellectuel with secondary school education	1814	12.65	12.56—12.73
	Intellectuel with higher education	547	12.58	11.27—13.90
	Housewife	190	12.67	12.03—13.32
	Retired	139	12.71	12.23—13.18
11. Occupation of father	Industrial manual worker	1482	12.70	12.05—13.36
	Agricultural manual worker	99	12.53	12.08—12.18
	Other manual worker	1038	12.65	12.42—12.89
	Intellectuel with secondary school education	958	12.64	12.51—12.76
	Intellectuel with higher education	916	12.66	12.43—12.88
	Retired	183	12.72	11.09—14.35
	Dead	138	12.45	11.28—13.64

SIZE OF THE PLACE OF BIRTH OF FATHERS. — On the basis of the size of the birt-place of fathers such a slight difference was obtained between the menarche-median of their daughters that according to this it is presumed that in our sample the size of the birth-place of fathers does not play role as an influencing factor in the beginning of menarche of their daughters (Table 1, 6. row).

SIZE OF THE PLACE OF BIRTH OF BOTH PARENTS. — It was also studied how the menarche-median of girls developed if both parents originated from settlements of the same size. In this regard those girls reached maturity later (their median being 12.93 years) those parents originated from settlements having a population lower than 5 thousand. However, those girls reached puberty earliest (with a median of 12.59 years) whose parents were born in settlements having 100—200 thousand inhabitants (Table 1, 7. row).

The difference of 0.34 year does not seem to be great, nevertheless it is note-worthy.

The tendency of the increase of the median was observable towards the low populated settlements. This may also be due to the varying number of girls who could be classed among the different settlement categories.

Similar results were gained on the basis of the earlier Hungarian data (FARKAS, 1979).

EDUCATION LEVEL OF MOTHERS. — Relatively few authors have studied whether there is any relationship between the education of parents and the time of puberty of their daughters (BIELICKI, 1982; DEMERDŽIEV—LAZAROV, 1978; RICHTER, 1973). The conclusions are not synonymous.

In the case of the girls from Szeged the education of parents was grouped into five categories (FARKAS et al., 1983). According to this the menarche-median of those girls was higher (12.88 years) whose mothers did not finish their primary school studies. Those girls reached maturity earliest (12.59 years) whose mothers have higher grades of education. The difference between the lowest and highest education

categories was found to be 0.29 year (Table 1, 8. row). Since the median showed steady change, disregarding one single smaller difference the education of mothers should be treated as an influencing factor.

EDUCATION LEVEL OF FATHERS. — Grouping the girls according to the level of education of their fathers, the difference between the median of the daughters of fathers having the highest and lowest education was only 0.11 year. However, the difference between the highest and lowest median was 0.24 year. The medians decreased with the level of education.

Similarly to the case of mothers, the daughters of fathers who received training for skilled work were only exceptions (Table 1, 9. row).

OCCUPATION OF MOTHERS. — Very few authors state that there is no connection between the occupation of mothers and the time of puberty of their daughters (BER-BROCINER, 1964; ROBERTS—DANN, 1967; ROBERTS et al., 1971). Others think it to be the strongest influencing factor (MILICER, 1968). The experience could be regarded as general that the daughters of intellectual parents reach puberty earlier than the children of manual workers. This is also supported by data from Hungary (BOD-ZSÁR, 1975; EIBEN, 1972; FARKAS, 1980).

Our results in respect to the girls of Szeged also refer to the fact (Table 1, 10. row) that the girls whose mothers are mental-workers reach maturity the earliest (median: 12.58 years) and those of industrial manual worker mothers mature the latest (median: 12.82 years). The median of the girls whose housewieves or retired cannot be adapted to this series. It is obvious that a great variety of original occupations could be ranked among the two categories and the development of the medians may be in connection with this.

OCCUPATION OF FATHERS. — The lowest median (12.45 years) was found for the daughters of fathers who have died, in this case the occupation is also not known exactly. The highest median (12.72 years) was obtained for the daughters of retired fathers. The difference between the two end values was 0.27 year (Table 1, 11. row). In respect to correlation, it would be difficult to take a position in any regard by analysing the medians obtained on the basis of the differing elemental number of the various occupational groups.

CONNECTION BETWEEN THE MENARCHEAL MONTH OF MOTHERS AND DAUGHTERS. — Authors have referred to this connection for a long time (BOLK, 1923, 1926; BOAS, 1932). TANNER (1962) defined its degree with a correlation coefficient of 0.40. However, we have no date from other sources on any observations regarding the coincidence with monthly punctuality of the menarche of mothers and daughters.

Studying the two events, we received the data that the menarcheal month of mother and daughter coincided in 203 cases out of 2831 girls (7.05%). The result of the chi-square test on 99.9% probability level allows the assumption that the coincidence of the two phenomena is not entirely accidental. Nevertheless, at the same time it should also be mentioned that the incidence of 7.05% is below the expected value in case of even distribution.

COINCIDENCE OF MENARCHEAL MONTH AND BIRTH MONTH. — Many references are found in special literature to the coincidence of the girls' menarcheal and birth month. It is a fact that presuming even distribution the coincidence of the two phenomena is

found in an incidence higher than 8.33% expectable in theory to fall to the same month. Despite this, certain authors do not presume any correlation between the two phenomena (BOILÉN—BENTZON, 1971), while others hold the coincidence verifiable by statistical test, too (BARIŠIĆ—GAVRILOVIČ, 1974). In the case of Hungarian girls the frequency of the coincidence varies from 8.15 to 14.86% (FARKAS, 1971). On the other hand, foreign authors report on values between 11.53 and 15.88%.

In our sample, coincidence was demonstrable in 304 out of 2966 cases, corresponding to a relative frequency of 10.25%. This could be taken as verifiable on 99.9% probability level with the chi-square test.

REGULARITY OF MENSTRUATION. — During the course of the collections of data the girls already menstruating were also questioned in regard to the regularity of their menstruation. In 271 out of 2852 evaluable data (9.5%) the girls questioned remarked their menstruation as not being regular. Out of them 70 girls were 14 years old, or younger. In their cases the irregular menstruation cannot be regarded as pathologic, considering the median of 12.68 years. The remaining 7.05% also indicates a rather great frequency, the importance of which can only be understood actually if taking into consideration that only few of these girls know they should turn to a medical specialist in such case. This again refers to the inadequacies of the sexual informative campaign.

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