Age at menarche in a marginal Spanish Gypsy group

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Summary

In Spain, gypsy people are the minority which is most poorly considered by the overall population. Gypsy women and girls are doubly marginalized both as a group and by their sex within the group. Many studies have demonstrated that menarcheal age is the most reliable biological indicator of ecological and social influences. Taboos and the marginal status of different ethnic groups can be detected through the use of this biological trait. The main objective of this paper is to show, for the first time, the relation between age at menarche and current socio-economic status in Spanish gypsy women.

The difficulty in gaining access to this minority, their low level of education, the prevention of institutional intervention, and taboos related to the reproduction concerned topics caused considerable difficulty in obtaining data. The research team worked for one year in the community in three marginal areas of Madrid in order to obtain a small (no. 150) but consistently representative group of women between 14 and 45 years of age. Anthropometric and reproductive variables were studied, as well as the women's economic, nutritional and health status. The retrospective method was used with a double comparison in two times. Women were informed and participated voluntarily in the study, carried out in 1998-1999.

The median age of menarche was 13.5 ± 1.33. When the sample was split up into two age groups (15-29 and 30-45 years old), a secular change was found (13.9 ± 1.43 and 12.9 ± 1.27 in women >30 and <30, respectively). The means are higher than the typical values found in the overall Spanish population. The evidence of the above-mentioned secular change was studied in order to determine the importance of other incidental factors, such as dietary tendencies and sanitary control. In this population, nutritional changes have occurred in the last few decades, so that nowadays their diet contains more calories and has a high animal fat content. In addition to better health, this study detected a great need for education with regard to nutritional habits, and showed that in women of this group overweight was becoming a problem.

Key words *menarche, Gypsy women, secular change, nutritional habits*

Introduction

In Spain, the Gypsies make up the oldest and most controversial minority group with respect to social level, and they are in fact the most poorly regarded group by the majority of society, thus giving rise to nuclei of marginalization and to low quality of life (1). Nevertheless, within the group of Spanish Gypsies there are different, clearly defined social levels, each of which maintains its sense of identity. Misery breeding grounds, the final stratum of this ethnic group, are made up of socially problematic shanty town populations established on the outskirts of cities, as in Madrid for instance.

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In 1986, the Autonomous Community and the Madrid City Council proceeded with a census and rehousing in Technical Social Units (TSU_s), which comprised dwellings with basic hygiene, an infant school and dining room, social services etc. These TSUs are a precursory step to the gypsies' definitive settlement in state housing. Despite this attempt, with respect to the idiosyncrasy, some behaviours persist that are not only social obstacles but also involve biological repercussions. The clearly secondary role of women in this collective, with respect to their access to education, health care and consideration, has been analysed in social and cultural studies, but not in the biological perspective. Gypsy law, the "Liry romani" is limiting with respect to women: "During her infancy she is dependent on her father, during her youth on her husband, and if he dies, on her male child, and if she has none, on her husband's relatives". These rules, in conjunction with discriminatory behaviours from infancy, may influence morbidity and the developmental process as a consequence of the double marginalization, involved by the fact of belonging to the group itself and of being a woman.

Puberty marks the moment when they give up schooling and their wedding is prepared. This normally takes place at the age of 15 of 16 years, although "without papers", given that this age is beneath the minimum required for marriage according to the Spanish Civil law. The "grandmothers" of the group continue to carry out virginity tests before the wedding. Puberty becomes a social as well as a biological Rubicon, characterized by significant somatic changes and rapid growth. These factors make this stage very receptive and reflective of the precarious situations of their living circumstances. Considering all the somato-physiological characteristics that can be analysed in women in this respect, menarcheal age is in fact the most reliable of the biological indices that show the ecological and social influences on growth and development. Furthermore it can be the sign of secular changes in different living conditions of contemporary populations. In the case of female Gypsy adolescents, the knowledge of the actual age of menarche is, with the two aforementioned causes, a source of interest due to its contrast with the age registered in the majority of society with respect to the knowledge of the persistence of nuclei of biosocial marginalization. Thus, the objective of the current study is to determine and analyse the age of menarche and its possible evolution in the studied marginal Gypsy collective, and also its variation in the "paya" population, seeking the environmental factors that could be responsible for the variation between both subpopulations.

Materials and methods

The studied population comprised 150 Gypsy women aged between 14 and 45 years. Access to this minority is restricted, and the low educational level, the prevention of institutional intervention and the taboos relating to reproduction concerned topics must be carefully considered in the attempt to obtain a small but consistent cross-sectional sample. Women were subdivided into two age groups (14-30 and 31-45 years of age), thereby allowing any modification in the age at menarche to be distinguished. Data were collected during 1998 and 1999. The research team worked for a year in the community to develop an informed perspective and friendly relations in the three TSUs in marginal areas of Madrid region. Our team was helped by a social worker to get an accurate knowledge of nutritional habits, state of health, occupation and family circumstances.

The mean age at menarche was estimated by the retrospective method. In order to minimize error, women were questioned twice, on different days, about the time of their first menstruation. The mean was corrected (+ 0.5 year) according to the method of Tanner (2). Dietary habits and daily food intake were measured by monitoring food

consumption in each family member and any visitors over a period of one week. Anthropometrics and reproductive traits were studied in accordance with IBP (3). Statistical analysis was carried out with the SPSS program. All the women participating in the study had given their informed consent to be included in it. The project was made possible by the support of the Spanish Ministry of Social Affairs and the Institute of Women's Studies.

Results

The sample analysed was entirely made up of women of reproductive age, none of whom had reached menopause yet: 85.33% of them were married and most of the 14.67% unmarried ones were younger than 20 years. The age at which they had married varied between 13 and 23 years (mean = 18.12 ± 3.70 years), indicating the persistence of their own traditional patterns that maintain the difference between the age they usually get married and the average age at marriage (approximately 25 years) of Spanish women. The number of children per woman has been estimated, although the women were still fertile, to be much greater than the estimated national average of the country (1.1 children/woman). The average of 3.1 children/woman, despite being also inclusive of women older than 30 years of age, may be expected to increase until the end of their fertile cycle. Abortion is not permitted in the Gypsy community and is rarely performed. Contraception is exclusively up to the woman, the use of the contraceptive pill being very uncommon. Men have no responsibility for family planning and traditionally "demand" their first child soon after marriage. The family nuclei studied were made up of more people than the strict nuclear family despite the impediment of the infrastructure of the TSU dwellings to expansion and overcrowding. On average, there were 5.3 people living in these housing units, although this number varied considerably, from 11 to 2 people, the latter case being that of a child and mother whose husband was in prison. The educational levels are very low, particularly as regards women, 16.6% out of whom are illiterate, 70% have rudimentary reading and writing skills, and only 13.4% have a basic level of education (primary school). The implicit concept of "mobility" in the Gypsy collective has considerably varied in the last few decades. The origin of the subjects making up the group we studied was mainly from the province of Madrid itself (no. 107), the others came from other Spanish provinces: Caceres (no. 29), Toledo (no. 8), Cordoba (no. 4) and Orense (no. 2) (table I).

The age of menarche calculated by the retrospective method has been calculated for the entire sample and for the two age groups under consideration, i.e., women over thirty years of age, and women aged thirty or less. The duly corrected values are summarized in table II.

The mean age at menarche in the Spanish Gypsy women we studied was higher than the aged reported for the general Spanish population in recent years (4-7) which place the mean age at less than 13 years. The subdivision of the sample by age group, i.e., subjects older than 30 years and

Table I *Social and demographic data of the Gypsy group studied*

	Mean ± SD	Maximum	Minimum
Age	24.80 ± 4.95	45.0	14.0
Age at marriage	18.12 ± 3.70	23.0	13.0
No. children/woman (women > 30)	3.1 ± 1.82	7	2
No. people living home	5.33 + 2.20	11	2

Table II *Mean and Standard Deviation of menarche in overall population and by age group*

	Mean	SD	V_{max}	V_{min}	No.
Overall population	13.55	1.3275	16	9	150
>30 years	13.80	1.4307	16	9	58
<30 years	12.90	1.2790	16	9	92

Table III *Recommended protein intake and actual intake in the collective studied*

	Recommended Spanish intake	Family sample	Women studied
Meat	2.0 - 2.5	5.58 ± 2.23	4.91 ± 1.98
Fish	2.5 - 3.0	0.81 ± 0.96	1.02 ± 0.97
Eggs	2 - 3	1.59 ± 1.42	1.50 ± 1.38
Milk and derived products	10 - 20	6.30 ± 2.43	7.30 ± 2.56

Table IV *Intake in juvenile groups, by sex*

	Sons 24 >= 16 years	Daughters >= 16 years
Meat	6.20 ± 2.1	4.78 ± 1.8
Fish	0.50 ± 0.9	1.00 ± 1.1
Eggs	2.00 ± 1.2	1.10 ± 0.9
Milk and milk products	5.96 ± 1.3	7.08 ± 1.2
Fruit juices	0.48 ± 0.9	0.92 ± 1.3

Table V *Discriminant analysis. Tests for univariate equality of groups (menarche < 13.5 years vs menarche > 13.5 years)*

Variable	Wilkin's Lambda	F	Significance
Age	0.753	8.59	0.008
Family size	0.921	0.903	0.926
Educational level	0.940	0.984	0.841
Nutritional deviations	0.722	10.42	0.0005

subjects aged 30 or less, or in other words, those born before or after the 1960s, reveals an important difference in this biological parameter to the extent of 0.9 years (approximately 11 months). Taking into account that the oldest woman included in our study was 45 years old, the decrease in this maturational trait is remarkable, being above the estimate for the Spanish population ($t = 3.93$; $p < 0.001$). The maximum and minimum ages, 16 and 9 years, respectively, did not change. The frequency curve is displaced towards earlier menarches without any modification in the range of variation of the character studied in this group. The aforementioned mean age at marriage was 18 years, reflecting a very uniform mean period of access to reproduction of 4 to 5 years (mean 4.8 ± 1.6). It also differentiates the group from the overall Spanish population once again, distinguishing the *theoretical* biological readiness from the social readiness for reproduction between 12 and 14 years, according to the most recent registers

of age of first maternity in Spain (Demografia 2000). If the mean age at marriage found in the group of Gypsy women seems low, then the range of variation is greater, with values between 13 and 23 years. More than 36% of the women in the sample had given birth to a child before reaching 17 years. Thus, it must be considered that some "urgency to have a first child" exists in the collective, which encourages adolescent marriages, leading to very early maternities and paternities. A parallel, detailed nutritional study of the Gypsy collective was carried out, and the relevant methodology and treatment were published (8). They both demonstrated the importance of nutrition on growth and growth rate. Sexual maturation is strongly influenced by this process and is conditioned by the nutritional status of the individual (9,10). Thus, this subsample was submitted to an analysis concerning the type and quality of the food consumed by the collective as a part of a broader study aimed, at finding out the nutritional patterns and the acculturation in the Gypsy collective. Table III summarizes the nutritional patterns of the women included in the studied group wich are different from those recorded for men (8). The control and reliability of this issue was assured through participatory observation, i.e., the researcher visited the home and personally checked "in situ" the quantity, quality and handling of the foodstuff. Quantifiable portions were then determined, which could be compared with the quantities recommended for the Spanish population.

Two facts stand out. First, the group's intake significantly deviates from the recommended quantities, and second, there are significant differences in the values of mean intake between the women and the men of the group. These differences between the two sexes were significant as regards meat ($p< 0.014$), fish ($p< 0.007$) and milk products, mainly because of the consumption of milk-based desserts ($p< 0.038$). This dimorphism of intakes becomes more marked when it is analysed in the infant, juvenile and adolescent stages (development period during which girls or boys are dependent on their father's home). The results obtained reveal significant differences in the intake of meat ($p< 0.008$), fish ($p< 0.0006$), eggs ($p< 0.005$), milk products ($p< 0.025$) and fruit juices ($p< 0.01$).

Althought still showing of discrepancies with respect to the recommended values, the data provided in table IV clearly reflect a behaviour favouring men as regards the type of food provided. The best quality of food (meat and eggs) is given to the sons, according to the Gypsy collective. The consumption of fruit and vegetables by sons and daughters is about one a third of the recommended ideal weekly quantity while, on the other hand, they eat four times as much bread than recommended. The very low iron content particularly affects women. The consumption of food which is a source of calcium is also scarce, although, in this case girls and boys have healthier habits.

Following the stated objectives, a correlation analysis carried out on the ages of menarche in sisters (no. 36) and in mothers and daughters (no. 48) yielded values of 0.43 and 0.37, respectively. The data collected clearly showed the existence of a genetic component in the timing of the adolescent growth spurt and first menses. High values where found with similar environmental, social and nutritional factors (sister-sister). A discriminant analysis was carried out where the age of menarche was considered a discriminant variable (menarche later than 13.5 years *vs* menarche earlier than 13.5 years), and age, family size and educational level, work occupation and deviation from recommended consumption values were taken as independent variables. Deviation from recommended consumption was calculated as the difference between the individual's total intake of milk products, meat, fish and eggs, and the sum of the recommendations for each category of foodstuff under consideration. Table V summarizes the values of the discriminant function statistics, derived by a step-wise procedure.

The age of the woman and the deviation from the dietary recommendations were the variables that allowed a discriminant function to be determined. In the step-wise analysis the first variable removed was nutritional deviation from recommended values (F=10.42); after step 1, only one variable had the F value allowing it to be included in the analysis: Age of the women (F= 6.79). After nutrition and age had been included in the model, no more variables were eligible for that. Seventy-eight point three percent of the cases were correctly classified, and including additional variables did not substantially improve the classification. The discriminant function in the studied group was:

D =0.436 Nut -0.247 Age +1.20

The special characteristics of the group with respect to the reproductive activity minimize the influence reported by other studies in relation to family size or to a very low educational level in all cases.

Conclusions

The study carried out in the Gypsy collective, despite being concerned with a small sample, has shown how there are some processes which are parallel to those occurring in the Spanish population with respect to the secular change in the age of menarche (4). However, the ages of menarche are still later, and this event is quite the opposite of the baseless belief that this collective has a much more precocious maturation (11). The former statement of an early menarche matches the fact of Gypsy marriages occurring at a very early age, as found in the "paya" community.

Our study reveals how, in the collective studied, the period of time between "biological readiness" and "social readiness" for reproduction is significantly shorter. It is well known that women brought up in suboptimal circumstances are likely to have children in their teenage years. Suboptimal life circumstances are likely to give rise to early child-bearing with an associated risk of a poor outcome. Children of mothers aged 16 years and under have an approximately two-fold greater risk of low birth-rate offspring and low weight is one cause of infant morbidity when compared with children born of mature women. There may be problems connected with growth and cognition as well as with an increased risk of chronic diseases (for example, diabetes and hypertension) in later life (12,13). The problem of traditional ethnicity with respect to early marriage, soon followed by maternity, persists in unions formed beyond the control of Spanish legislation (Gypsy marriages).

In addition to the above, we cannot forget that health and sanitary conditions are not very good and that the nutritional status shows important deficiencies that affect the spurt time of the aforementioned process and the condition in which maternity is approached. The low consumption of calcium and the different mode of access to quality food of men and women in the group of Gypsies we studied might be the sources of morbidity risk. The lack of education is one of the main factors of the problem although the population has undergone socioeconomic improvements. These improvements do not affect the quality of the food consumed, but they result in an increase in the consumption of low quality, industrially produced foodstuff, mainly pastries and sweets (14,15).

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