

Paleodemographic Structure and Human Life Span in Populations from the Bronze Age According to Data from Paleoanthropological Material from Funeral Monuments

V. Russeva

*Institute of Experimental Morphology and Anthropology,
Bulgarian Academy of Sciences, Sofia*

Data from the anthropological material from the Bronze Age in Bulgaria are analyzed in order to obtain information of age and sex structure of the paleopopulations. Information about survivorship and mortality in the populations from the period is obtained with methods of paleodemography. Results give good possibility for comparison with data on the Chalcolithic period in Bulgaria.

Key words: Bronze Age, life span, mortality.

Introduction

The anthropological material from the Bronze Age in Bulgaria falls into two chronological periods — of the Early and the Late Bronze Age. The problem for synchronization of Bulgarian archaeological material with the material of the Middle Bronze Age in Anatolia and Greece has not been resolved in the Bulgarian scientific literature so far. A lack of sources between early and late materials can be established. The territorial distribution of the anthropological finds from the Bronze age is also irregular. The material from the Early Bronze Age comes from mounds of Pit-grave culture area dispersed in North and South-East Bulgaria and from a population from Yunatsite (South-East Bulgaria), dated in the end of the period. The material from the Late Bronze Age comes from South-East Bulgaria, Thracian lowland. A lack of material from South West Bulgaria in the whole Bronze Age and North-West Bulgaria in the Late Bronze Age is present. The available material does not allow a profound reconstruction of the paleodemographic situation in the period.

Material and Methods

Data about sex and age-sex distribution of individuals, recorded in the anthropological material from the archaeological sites presents information for extinct populations both biological, for the changes in human life span and mortality, and socio-cultural, for the position taken by different sex and sex-age groups in the paleocommunities. This information can be obtained analyzing the sex and age distribution of anthropological material, paleodemographic analysis [1] and adequate interpretation of the results. The latter should be regarded comparative by pointing out to the global tendencies in changes in the human life span, limiting divergent cases in the picture of sex-age distribution, and for seeking explanations of deviations from normal distribution.

Most of the investigated material from the Early Bronze Age comes from mounds of Pit-grave culture in Bulgaria — Belogradets, Zheglartsi-Orlyak, Poruchik Geshanovo [4, 9], Tarnava (Glavchova Mogila) [9, 2], Riltsi (unpublished information from Dr. B. Dimitrova and prof. Dr. Y. Yordanov). Data about population of Tells in Thracia presents the material from Yunatsite (unpublished information from Dr S. Cholakov). Single finds also should be added— Tabashka Cave [2], Nova Zagora (unpublished information from Dr. S. Cholakov). Late Bronze age material is from Golyama Detelina [5, 8], Malka Detelina [6.], Nova Zagora [7], Dyadovo, Assenovets, Bogdanovo, Starosselets, Sudievo (unpublished information from Dr. S. Cholakov).

Results and Discussion

Necropolises of the Pit-grave culture show high deviations in sex-age distribution of anthropological material as compared to the acceptable (Fig. 1). In all of them prevail skeletons of male individuals. There occur cases of mounds with only men skeletons, e.g. Plachidol III-V, Belgradez I, II, IV, Jeglarzi II, Rilzi 260. The extraordinarily low per cent of female skeletons in the anthropological material from mounds of Pit-grave culture in Bulgaria suggests that the female part of the material is not representative. The age of the female individuals in the anthropological material from Pit-grave culture does not exceed the age group of Adultus, for exactly determined skeletons (3 versus 1) — 35 years of age. It is still early to make definitive conclusion, but it seems that in the stock-breeding groups which left the mound necropolises women did not present actively, and the cases of presence of female individuals should be possible explained like individuals with social status of adolescents, or young women, remained in the parent family. Strong deviation in the sex-age structure of groups, represented

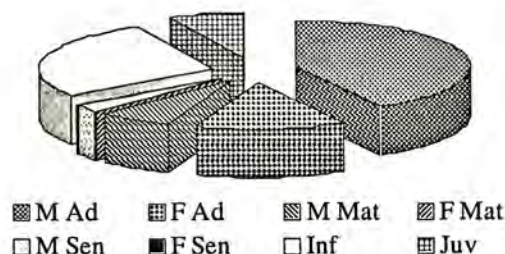


Fig. 1. Age and sex distribution of the anthropological material from Pit-grave culture



Fig. 2. Age and sex distribution of the anthropological material from Yunatsite

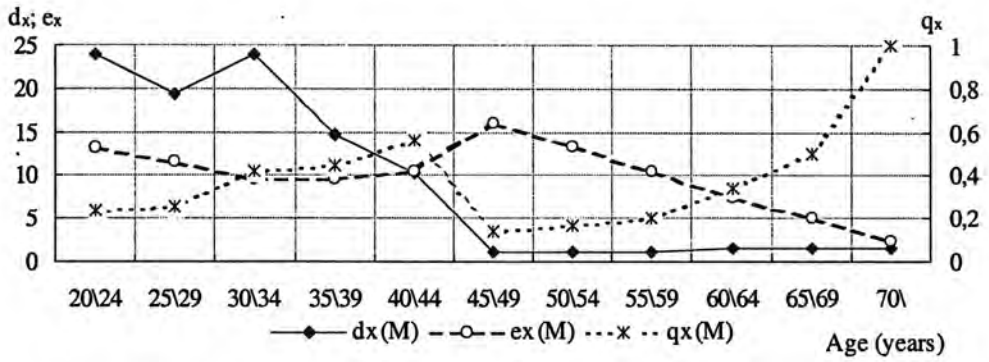


Fig. 3. Plots of relative number of dead, life expectancy and risk of death according to mail skeletons from Pit-grave culture

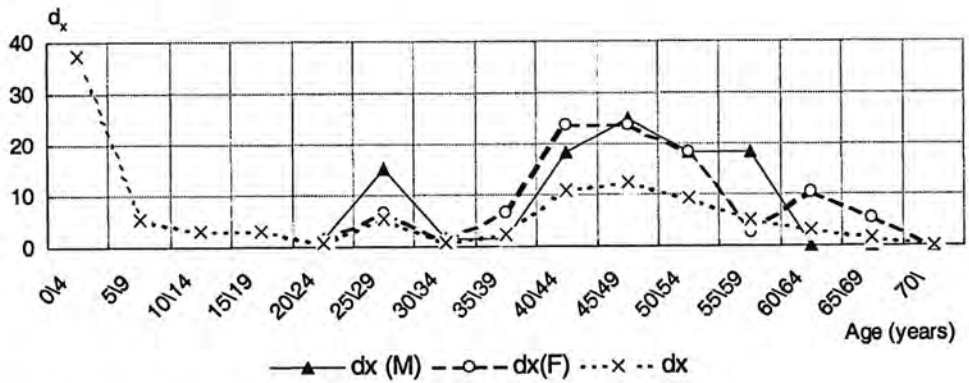


Fig. 4. Plots of relative number of dead in the population of Yunatsite

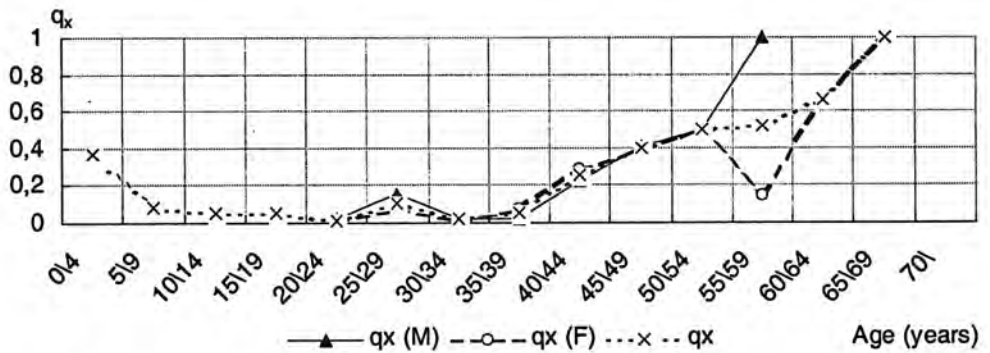


Fig. 5. Plots of risk of death in the population of Yunatsite

in the anthropological material of Pit-grave mound necropolises is well expressed as compared to the population, represented in the material from the necropolis in Yunazite from the end of the period of the Early Bronze Age and the material known from the previous period of Chalcolithic from North-East Bulgaria, or area partly coinciding with the area of diffusion of Pit-grave necropolises [3]. The material from Yunatsite (Fig. 2) shows a relatively equal per cent distribution of male and female individuals as a whole as well as in the age groups of Adultus, Maturus, while only females are found in Senilis.

Because of the reduced quantity of the materials studied from Pit-grave necropolises they are summed in order to construct a life-table. The reduced number of infant skeletons makes impossible obtaining correct information about infant mortality and the human life span of individuals of first age group (0-4 years of age) in the populations of Pit-grave culture from Bulgarian monuments. Presently, it seems that interments of children in the mounds are incidental. The situation with female skeletons is similar. Paleodemographic analysis is possible only for data about male population and concerns the male part of the population more correctly represented in the Pit-grave necropolises. Here also some distortions in the life tables are observed with very low number of skeletons of individuals determined at the age over 45 years. Values of the relative number of dead are relatively high in the first age group of adults (20-24 years of age) — 22.83 %, in the next age group values slightly decrease and are highest in the age group of 30-34 years of age — 27.17 % (Fig. 3). At this age more than half of the adult population is extinct and in the age of 35-39 years relative number of survived is 31.52 %. After the rise of mortality in the age group of 30-34 years values for relative number of dead rapidly decrease and after 45 years of age keep on a very reduced level in consequence of very reduced number of survived. It is also possible that the old men are not correctly represented in the material from mounds. The life span expectancy in the first age group of males in age group of 20-24 years is consequence of the high mortality by young men calculated as 13.15 years, while in the group of 45-49 years the values of life expectancy are the highest — 16.04 years and remain relatively high in the next age groups, e.g. 7.45 years for age group of 60-64 years (Fig. 3, Table 1). These results are due to the constantly low relative number of skeletons in these age groups with very reduced absolute number of them and can hardly be explained with favorable condition for human life span in these population.

The material from Yunatsite suggests an acceptable distribution in age and sex groups (Fig. 2). The high percentage of infantile skeletons (44 %), the most of them are in the first age group (37.12 %), supposes that children are well represented in the anthropological material. The number of skeletons, determined in the both sexes are relatively equal. The highest mortality in the population appears in the first age group (Fig. 4), a characteristic feature for all periods preceding the Renaissance. In this age group appears the first peak in the values of risk of death (Fig. 5). For survived this age values of risk of death strongly decrease. Values of relative number of dead are the lowest at the age between 10 and 24 years. The low values of relative number of dead by young females is peculiarity of this necropolis (Fig. 4), while in most other cases an increase in mortality is observed and explained with pathology during pregnancy and birth. In the material from Yunatsite values of relative number of dead in 20-24 years by females are lower and in the next age group even ca. three times lower than these by males. Reason for this situation probably should be searched in peculiarities in the funeral ritual or insufficient preservation of female skeletons. The peak in mortality

Table 1. Values of life expectancy

| Necropolises | e_0 | M_{20-24} | F_{20-24} | M_{40-44} | F_{40-44} | M_{60-64} | F_{60-64} |
|--------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|
| Pit grave | 23.65 | 13.18 | 8.75 | 10.61 | 0 | 7.45 | 0 |
| Yunatsite | 26.29 | 25.50 | 27.63 | 9.79 | 10.63 | 0 | 4.17 |
| LBA | 25.33 | 23.48 | 18.02 | 7.02 | 6.25 | 0 | 0 |

by the two sexes of adults starts smoothly after 40 years of age and goes slowly down after the age of 55 parallel with decrease of relative number of survived till this age. Half of the adult population dies to the age of 50 years. There are three female skeletons of individuals reached the age over 60 years found in the material.

The favorable results for relative number of dead, risk of dead and relative number of survived reflect on high values of age specific life expectancy for both sexes (Table 1). In the age group of 20-24 years life expectancy is calculated to be on the average 25.5 years by men and 27.63 by women and in the age group of 40-44 years 9.79 and 10.63 respectively. These data point out to very favorable conditions of survivorship in the population, which has left the necropolis by Yunatsite.

The population, represented in the material from Yunatsite shows definitely better conditions of survivorship and reduced mortality in all age groups and both sexes compared to the known anthropological material from the previous period of Chalcolithic in Bulgaria with life expectancy in the age group of 20-24 years on the average of 9.31 to 12 years (according to the material from different necropolises) and strongly reduced values for females, lack of skeletons of individuals, determined at the age over 60 years, extinction of the half of the population of adults in younger age — between 25 and 34 years [3]. It seems that in spite of advanced social and material culture of late Chalcolithic period expressed in the archaeological material, the chalcolithic populations remains, from the point of view of life span, at a relatively low level of development compared with the population from Early Bronze Age, represented in the material from Yunatsite. Presently it is early to resolve the problem if the material from the site represents an exception with increased indices of survivorship between the synchronous populations.

The sex distribution of the material from the Late Bronze Age shows relatively equal number of male and female skeletons both in the total material (Fig. 6) and in the material from bigger necropolises (Goljama and Malka Detelina, Nova Zagora). Percentage of infantile skeletons varies between 28,57 % and 35 % in the bigger necropolises or it is 37 % in the overall anthropological materials studied. This portion of infant skeletons probably is reduced due to bad preservation of bones, but is sufficient for deriving information about human life span in the first age groups.

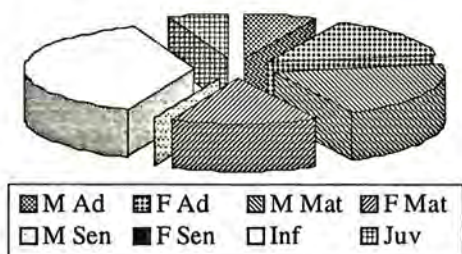


Fig. 6. Age and sex distribution of the anthropological material from the Late Bronze Age necropolises in the South-East Bulgaria

Data from the Late Bronze Age necropolises, even from the bigger ones — Golyama and Malka Detelina and Nova Zagora do not allow the construction of separate life tables. Life table is based on all anthropological data from the period. Such method could be applied based on the same chronological

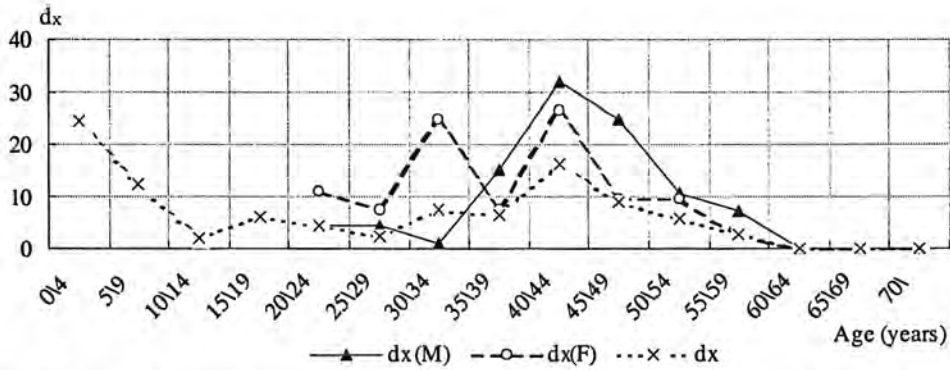


Fig. 7. Plots of relative number of dead in the anthropological material from Late Bronze Age necropolises in the South-East Bulgaria

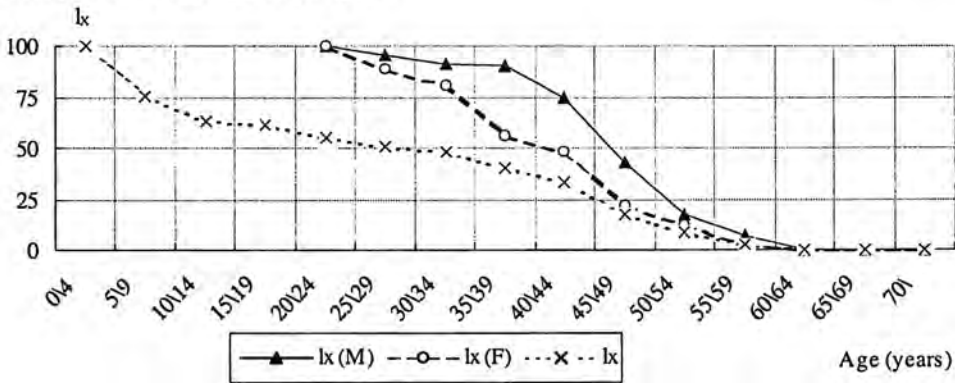


Fig. 8. Plots of relative number of survived in the anthropological material from the Late Bronze Age necropolises in the South-East Bulgaria

and cultural identification and region of spreading of finds. The material from the Late Bronze Age shows again highest mortality in the first age group (0-4 years). Values for the relative number of dead reach 25 (Fig. 7). Differences between two sexes are clearly manifested in this material— twice bigger mortality by women in the first age group as compared to men in the same age group (Fig. 7). The peak in mortality by women appears earlier than that by men. Lower values for life expectancy by women (18.01) in comparison with men (23.48) from first age group are in agreement with the established values of mortality (Table 1). No individuals over 60 years of age are found in the material, which represents Late Bronze Age populations from South East Bulgaria. Half of the population of adults dies at the age 40-44 for women and 45-49 for men (Fig. 8). Few persons could reach age over 50 years and, probably, have been treated like senile by the rest of the group.

Conclusions

Life expectancy in the Bronze Age shows a tendency of rising in relation to the Chalcolithic period, but keeping features of demographic primitive society — high

infant mortality, compensated with high birth rate, high mortality by young women, reduced number of senile individuals. Differences between different necropolises should be more conveniently explained with differences in funeral rituals, or social organization and not with strongly different paleodemographic situation in populations.

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