Coll. Antropol. **42** (2018) 2: 83–88
Original scientific paper

Secular Trends of Children from Birth to Age 3: Meta-Analysis of Data from Russia and the Neighboring Countries

Elena Z. Godina, Anna K. Gorbacheva, Tatyana K. Fedotova

Lomonosov Moscow State University, Institute and Museum of Anthropology, Moscow, Russian

ABSTRACT

The goal of the study is to investigate secular changes in main anthropometric traits of the newborns, infants and children of early age, using a wide spectrum of the urban samples from modern Russia and the former USSR, through the period of several decades, from 1920th till now. The study summarizes the data of 338 samples of the newborns, 188 samples of 12-months old infants, 168 samples of 2-year old children, 256 samples of the 3-year old children. The secular dynamics of the body length describes the process of a significant increase of the skeletal development of children of both sexes in all growth periods. This trend is combined with the stability in body mass parameter of the newborns and infants, significant increase in body mass of 2-year-olds, and a slight increase in body dimension in 3-year-old children. The values of head circumference in newborns decrease from the 1950's to 2000's by 1.1–1.2 cm, which could be explained by the trend of a decrease in maternal pelvic width discussed in the literature. This trend completely stops by the end of the first year of life, and the 12-months old infants experience secular stability of this parameter. The head and chest circumferences of 2- and 3-year-olds keep stable through the time period under consideration.

Key-words: *auxology, secular trends, physical development, newborns, infants, early age children, Russia*

Introduction

Monitoring of children's growth is one of the important tasks for human biologists in every country. The latest literary sources present a wide spectrum of local (regional) studies, limited often by small historical time space of 10–30 years, rarely more[1–11]. The whole sum of the world studies, describing secular dynamics of the main physical development indices in children and their somatic status, gives a very mixed picture, and points to a variety of possible particular (special) factors of secular changes and their effects: different geographical locations[12–18], different historical intervals, different ontogenetic periods[19–20], for rural and urban children, for the full-term and pre-term children[21–24], for parents and their offspring, for different body dimensions (body length, body mass, circumferences, skinfolds, etc.) and their combinations, resulting in somatotype variability[25–26]. The diversity of these factors may be still generalized by the common concept – the level of anthropogenic pressure, which means the level of economic modernization of the society, the level of technogenic and informational stress, the level of the ecological, in a broad sense, comfort or discomfort.

Monitoring of anthropometric dimensions of children aged 0–3 years is very important for Russian anthropology, as the studies on the morphology of children at the beginning of postnatal ontogenesis are not numerous. There are several studies of the newborns from Moscow in the 20th century[27–29], infants of Moscow in the 20th century[30], the newborns of modern Belgorod[31–33], modern Moscow newborns, infants and early age children[34–42], and from the neighboring countries – infants of Lithuania in the 20th century[43–45].

The goal of this research is the analysis of secular changes of four main anthropometric traits in children from birth to three years: total dimensions (body length and mass) and circumferences of the head and chest as markers of body proportions.

Child's growth from birth to three years is a very specific period in the life history. Its biological meaning is the rapid morphofunctional development, intensive quantitative growth, compared only to the pubertal growth spurt, and the active search of the stable growth curve[46]. The newborn's body dimensions mark the quality of the intrauterine growth, mediated significantly by the maternal conditions.

Received for publication November 11, 2017

One-year old children's body dimensions mark the quality of the period of infancy or the period of compensatory growth. Two-year old children's body dimensions describe the status of the organism, almost completely independent from the circumstances of the intrauterine growth. Three-year-old's body dimensions may be considered, with some reservations, as the beginning of the stable ontogenetic trajectory and the conventional boundary between physiologically and behaviorally dependent organism and the relatively autonomic growing organism. Hence, our analyses include the secular somatic dynamics of the newborns, one-, two- and three-year old children.

Material and methods

The study is based on the data from Russia and the former USSR. The subject of the study, as already mentioned, are the newborns – 338 samples from the 1920's to 2010's with the ten-year interval; one-year old infants – 188 samples from the 1930's to 2010's with the ten-year interval; two-year old children – 116 samples from the 1950's till now and three-year old children – 256 samples from the 1950's till now, also with the ten-year intervals. Using the fixed age intervals allows, in addition, to minimize the effect of the age dynamics of the parameters of intragroup variations and correlations of the dimensions[47–49].

The main source of the data are collections of the materials on physical development of children and adolescents of Russia and the former USSR, regularly published by the Research Institute of Children and Adolescents Hygiene and Health Protection. The data were collected according to the common research protocol and were completely comparable[50–54]. The additional source of the data include local standards[55–58], articles and some archive data of the authors of the present paper.

The number in each age/sex group was not less than 100 subjects, while the total number of the data array was over 90,000 individuals. The object of the research were four main anthropometric body dimensions: body length as a marker of the skeletal development, body mass as an integrative marker of metabolism, head and chest circumferences as markers of the somatotype proportionality. The change of the body proportions in the direction of the leptosomic somatotype, e.g. a decrease of the circumferences as compared to the total body dimensions, usually coincides with the weakening of the physical conditions and the adaptive potential of the organism, which was proved by a number of auxological studies on elder children. Besides, a decrease of the ratio »circumferences/total body dimensions« in the newborns is associated with an increase of a number of the intrauterine growth disorders (»disembriogenesis stigma«), while an increase of this ratio together with a decrease of a number of stigma are related to the middle level of the heterozygosity and a better forecast for further development[59].

Statistics

To estimate the level and direction of the associations between anthropometric dimensions and temporal factor, the scattering diagrams were used as an effective instrument while dealing with the big set of sample means[60], when individual data are not available and hence the multivariate biometrical methods cannot be applied. The scattering diagrams were built for each dimension and each age/sex group with the obligatory calculation of the correlation coefficients and the estimation of the confidence level.

Results and discussion

The long-term dynamics of body length is uniform for the children of all age and sex groups and consists in a significant increase of the dimension or the acceleration of the skeletal development. The secular increase for the newborns (Fig. 1a) from the 1920's till 2010's is over 2 cm

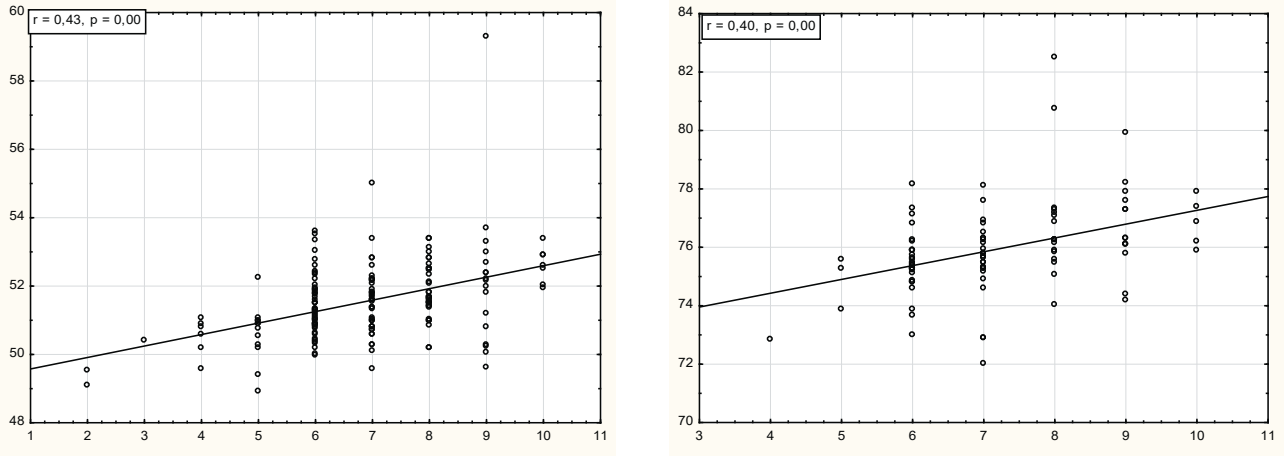

Fig. 1. Secular dynamics in body length of male newborns (a) and 1-year old infants (b) of the Russian cities. Axe X – time decade intervals: 3 – 1930's, 4 – 1940's .... 10 – 2000's, 11 – 2010's; Y – average values of body length, cm.

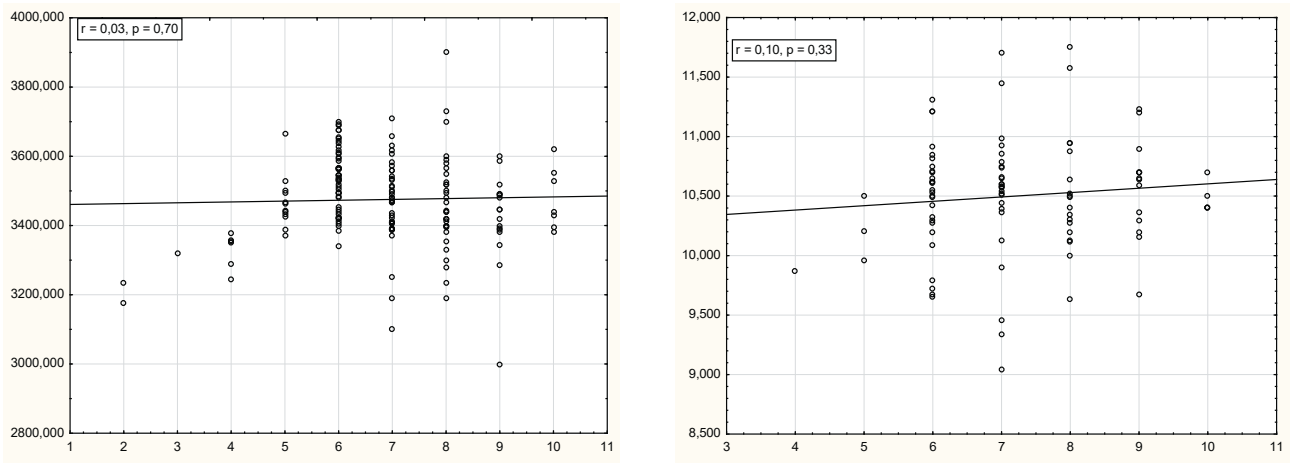

Fig. 2. Secular dynamics in body mass of male newborns (a) and 1-year old infants (b) of the Russian cities. Axe X – time decade intervals: 3 – 1930's, 4 – 1940's.... 10 – 2000's, 11 – 2010's; Y – average values of body mass, kg.

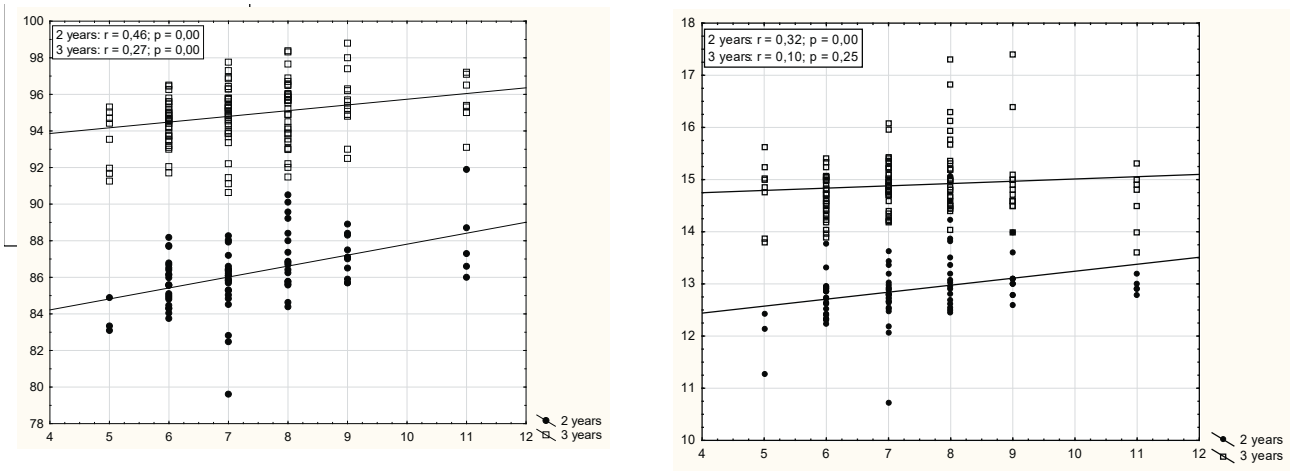

Fig. 3. Secular dynamics in body length (a) and body mass (b) of the 2-year old boys and 3-year old children of the Russian cities. Axe X – time decade intervals: 5 – 1950's, 6 – 1960's.... 11 – 2010's; Y – average values of body length, cm (a) and body mass, kg (b).

for both sexes, r=0.27–0.37, p=0.00. The increase for the 12-months old infants (Fig. 1b) for the 1930–2010 time period is 4.7 cm for boys and 3.8 cm for girls (r=0.4 for both sexes, p=0.00).

The value for the 2-year old children (Fig. 3a) from the 1950's till 2010's is about 3 cm (r=0.46–0.47 for boys and girls respectively, p=0.00).

The increase for the 3-year old children (Fig. 3a) through 1950–2010 interval is about 2 cm (r=0.27 for both sexes, p=0.00). A smaller secular increase in length for 3-year old children as compared to the 2-year-olds through the same time interval may reflect the well-known fact of the gradual (progressive) decrease in growth velocities of the discussed dimensions in children from 0 to 3 years, although their common level is still high enough[61].

Such uniformity is not typical for the secular trends in body mass. Newborns and infants (Fig.2a, Fig.2b) experience the temporal stability of this dimension. A slight increase of the body mass in newborn girls (50g throughout 80 years) is not significant (r=0.08, p=0.33). It is worth mentioning that the newborns' body mass is the classic object of the stabilizing selection[62], and the greatest contribution to its variability belongs to the »family« factor – i.e. body mass at birth of parents and sibs, the determination coefficient of which is about 0.16 as compared to 0.01–0.04 for all other possible factors[35].

Some increase in this dimension of 1-year old children through the period of 60 years (300–400 g) is not significant as well (r=0.03–0.33, p=0.17–0.33). Such combination of secular trends in two total body dimensions reflects the increase of leptosomy in newborns and infants.

Different secular changes of the body mass are typical for the children of an early age. Two-year old children (Fig. 3b) have the synchronous increase of both body length and

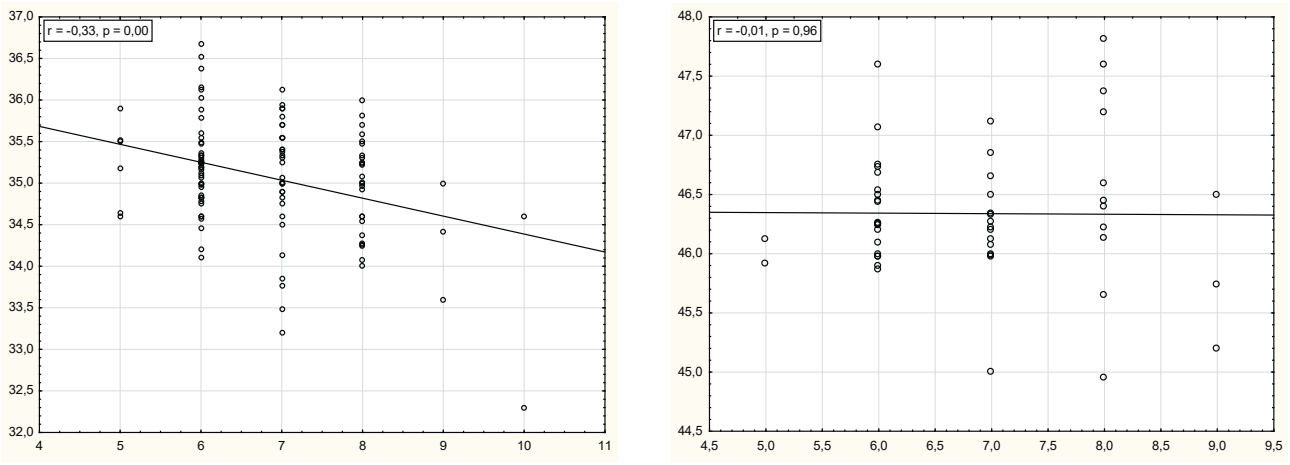

Fig. 4. Secular dynamics in head circumference of newborn girls (a) and 1-year old infants (b) of the Russian cities. Axe X – time decade intervals: 5 – 1950's, 6 – 1960's.... 9 – 1990's; Axe Y – average values of head circumference, cm.

body mass, the latter being about 700 g for the period of 1950–2010 (r=0.32, p=0.00 for boys and r=0.27, p=0.01 for girls). For 3-year-olds (Fig. 3b) this trend is close to the significant level. Thus, the secular trend to leptosomy is less expressed in 2- and 3-year old children as compared to the newborns and infants.

Secular dynamics of the chest circumference through different age periods is not uniform as well. For the newborns, secular changes in this dimension repeat the dynamics of body length, which allows to postulate the acceleration of the skeletal development in general, because body length can be considered as an «absolute» marker and the chest circumference as a reliable enough marker of skeletal development. The trend is significant for the newborn boys (r=0.18, p = 0.03) and close to the significant level for the girls (r=0.16, p=0.06). The long-term dynamics of the chest circumference of the 1-year old children demonstrates a very slight secular decrease of this dimension, which means the change in infants' body proportions towards leptosomy as compared to the newborns.

This trend is not significant, but different vectors of secular changes in newborns and infants deserve attention. It means that secular increase in chest circumference as the result of intrauterine growth completely disappears by the age of 12 months as a result of the compensatory growth through the infancy period. For 2- and 3-year-olds no secular changes in this dimension were found. Combined with the permanent secular increase in body length this trend also confirms the phenomenon of a secular increase in leptosomy.

The secular dynamics of head circumference also has some specific traits in different age periods. For the newborn boys and girls (Fig. 4a) in the 1950–2010 time period, there is a significant decrease of this dimension by 1.2 and 1.1 cm correspondingly (r=0.27–0.37, p=0.00). This trend corresponds to the secular decrease in maternal pelvic width, frequently discussed in the literature.

The 1-year old children (Fig. 4b) have stable values of this dimension through the same time interval, thus the secular trend of deceleration in the growth of head circumference in the newborns is completely compensated till the end of the infancy period. Equally, the secular stability of the dimension is characteristic for the 2- and 3-year old children.

Secular trend towards leptosomy embraces children of both sexes and all age groups under consideration, though in various degree, and reflects the heterochrony of the secular dynamics in body length, body mass and circumferences. The trend of the secular increase in leptosomic body build was noted for children and adolescents from 3 to 17 years of age in the 1970's–1990's, mostly from urban locations[38,62,64–67]. Nowadays the situation is opposite – the tendency towards adiposity prevails[2,68–71].

Thus, the secular increase in leptosomy of the newborns and early age children in the 2000's, may correspond to the morphological peculiarities of their potential mothers – adolescents in the 1970's –1990's – with the pronounced leptosomic somatotype.

This similarity points to the existence of the intergenerational associations of the long-term microevolutionary somatic changes. The same parallelism in the secular dynamics of body dimensions of »parent and offsprings« (newborns and 18-year-old young females) is demonstrated for the population of the Polish cities, Poznan and Krakow[72].

The long-term deceleration of the intrauterine growth of the head circumference may be probably regarded as an adaptation to some secular changes to more narrow width of maternal pelvis and an increase of mothers' leptosomic body build in general, regularly registered for different regions of Russia since the 1980's [73–77].

It is worth noting that the analysis of changes in anthropometric dimensions of Moscow newborns from 1880's to 1960's revealed the most intensive increase exactly for

the head circumference combined with more moderate increase in body length and mass and the decrease in abdomen circumference. Such variations in the dynamics of head circumference of the newborns during different historical periods confirm the thesis about fluctuations in secular changes[27].

Apparently, the most advanced approach towards monitoring of children's growth from birth to 3 years of age should consist of the analysis of the intra-group variability and dynamics of body dimensions of the offspring in close connection with the maternal morphological status. In this way, the physical status of the consecutive generations may be examined in their inevitable and logical succession and interdependence[21,25,32,38,78–82].

It is important to notice that the patterns of secular changes in different ethnic and territorial groups in Russia and the neighboring countries are not identical through different decades, and have some local peculiarities[4–5]. But the vector of the secular trends is common for all regions — the increase in body length combined mostly with insignificant or negligible changes in body mass. Local variations in growth patterns point to the necessity of the regional growth charts.

Conclusions

The results of this research reveal the heterochrony of secular changes in different characteristics of physical development of children at the beginning of their postnatal ontogenesis. This leads to the increase in leptosomic somatotypes of the newborns, infants and early age children. The absence of uniform patterns in temporal dynamics of the anthropometric traits of the newborns, 12-months-old infants, 2- and 3-year old children is shown as well. The secular dynamics of the body shape of children aged 0–3 years corresponds to the morphological status of their potential mothers, and points to the existence of the inter-generational associations in the long-term microevolutionary morphological changes.

REFERENCES

1.HADZIHALILOVIC J, HALILOVIC SH, BRAHIMAJ F, BEGIC A, TUPKUSIC R, MESALIC L., Med Arh., 5 (2009) 267. — 2. HERMANUSSEN M, GODINA E, RÜHLI FJ, BLAHA P, BOLDSEN JL, VAN BUUREN S, MACINTYRE M, ASSMANN C, GHOSH A, DE STEFANO GF, SONKIN VD, TRESGUERRES JA, MEIGEN C, SCHEFFLER C, GEIGER C, LIEBERMAN LS., Homo, 4 (2010) 277. — 3. HŌRAK P, VALGE M., Evol Med Public Health, 1 (2015) 167. — 4. IANKOVA I., NACHEVA A., Akush ginekol (Sofia), 1 (2007) 37. — 5. LI H, ZHANG YQ, ZHU ZH., Zhonghua yu fang yi xue za zhi, 3 (2009) 182. — 6. MIRMIRAN P, MOSLEHI N, ASGHARI G, JAMBARSANG S, MEHRABI Y, AZIZI F., Ann Hum Biol., 1 (2013) 75. — 7. ROELANTS M, HAUSPIE R, HOPPENBROUWERS K., Ann Hum Biol., 6 (2009) 680. — 8. SCHACK-NIELSEN L., MØLGAARD C, SØRENSEN TI, GREISEN G, MICHAELSEN KF., Obesity, 7 (2006) 1257. — 9. SCHÖNBECK Y, VAN DOMMELEN P, HIRASING RA, VAN BUUREN S., PLoS One, 5 (2015) 1. — 10. OISHI K., HONDA S, TAKAMURA N, KUSANO Y, ABE Y, MOJI K, TAKEMOTO T, TAHARA Y, AOYAGI K., J. Physiol. Anthrop. and Applied Hum. Science, 5 (2004) 155. — 11. BRALIC I., RODIN U, VRDOLJAK J, PLAVEC D, CAPKUN V., Croatian med. J., 3 (2006) 452. — 12. BIYANOVA I.G., MERZLOVA N.B., BIYANOVA A.N., Voprosy sovremennoy pediatrii, 1 (2013) 154 (in Russian). — 13. GRICINSKAYA V.L., Hygiene and sanitaria, 1 (2012) 57 (in Russian). — 14. ELIZARIVA T.V., ZRYACHKINA N.I., Rossiyskiy pediatricheskiy zhurnal, 2 (2012) 26 (in Russian). — 15. KALMYKOVA A.S., POPOVA M.A., FEODOSIANI O.S., TKACHEVA L.V., Rossiyskiy pediatricheskiy zhurnal, 6 (2007) 48 (in Russian). — 16. POPOVA I.V., ZHUKOVA V.N., BELYAKOV V.A., DOKUCHAEVA S.YU., The problems of the social hygiene and history of medicine, 1 (2006) 22 (in Russian). — 17. SENKEVICH O.A., SIROTINA Z.V., DENISOVA M.E., VOLOSHENKO I.V., Dalnevostochniy medical journal, 2 (2006) 32 (in Russian). — 18. WON S.W., KRAMER M.S., PLATT R, DEMISSIE K, JOSEPH KS, LIU S, SAUVE R., Pediat. and Perinatal. Epidem., 4 (2003) 347. — 19. ZONG XN, LI H, ZHU ZH., Am J Hum Biol., 2 (2011) 209. — 20. STEIN AD, BARNHART HX, WANG M, HOSHEN MB, OLOGOUDOU K, RAMAKRISHNAN U, GRAJEDA R, RAMIREZ-ZEA M, MARTORELL R., Pediatrics, 3 (2004) 270. — 21. HOP L.T., Asia Pacific J. Clin. Nutr., 3 (2003) 266. — 22. DAVIDSON E., LITWIN A, PELEG D, ERLICH A., Isr. Med. Assoc., 9 (2007) 649. — 23. BEGIĆ A, HALILOVIĆ JH., Coll Antropol., 2 (2015) 353. — 24. FRANČIŠKOVIĆ V, ZAPUTOVIĆ S, FINDERLE A, PETROVIĆ O.,J Matern Fetal Neonatal Med., 18 (2014) 1912. — 25. CARRASCOSA A, YESTE D, COPIL A, GUSSINYÉ M., Med Clin (Barc)., 12 (2004) 445. — 26. AMIGO H, BUSTOS P, VARGAS C, IGLESIAS P., Rev Chil Pediatr., 4 (2015) 257. — 27. NIKITYUK B.A., Voprosy antropologii, 42 (1972) 78. (in Russian). — 28. NIKITYUK B.A., ALPATOV A.M., Voprosy antropologii, 63 (1979) 34 (in Russian). — 29. NIKITYUK B.A., MUSAGALIEVA M.S., SAVCHENKO K.A., Acceleration of the child development and its consequences. (Kazachstan, Alma-Ata, 1990). (in Russian). — 30. KHAZANOVA A.B., The estimation of the constitutional types of infants. In: Nikitiuk B.A. (Ed) The estimation of the constitutional types of children and adolescents. Collected articles. (Academy of Pedagogical Science of the USSR, Moscow, 1976). (in Russian). — 31. KRIKUN E.N., Diversity of the morphofunctional indices of the human organism under the influence of the unfavourable ecological and biological factors. MS thesis. In Russia (Moscow, 2006). (in Russian). — 32. KRIKUN E.N., Nauchnye vedomosti Belgorodskogo gosudarstvennogo universiteta. Seria: Medicina. Farmacia, 8 (2009) 57 (in Russian). — 33. KRIKUN E.N., Zdorovie dlya vsekh, 2 (2011) 28 (in Russian). — 34. BOROBKOVA N.P., YAMPOLSKAYA YU.A., FEDOTOVA T.K., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 2 (2012) 100 (in Russian). — 35. BOROVKOVA N.P., The newborn body dimensions in connection with the morphological indices of mothers. In: Proceeding (XIX International science conference of students and young scientists Lomonosov – 2012. Section »Biology«, Moscow, 2012). (in Russian). — 36. FEDOTOVA T.K., BOROVKOVA N.P., KLADOVA L.I., The correlation of the body dimensions of the mother and the newborn. In: Proceeding (VIII Mezinarodniy vedecko-prakticka konference »Dny vedy – 2012«, Praha, 2012). (in Russian) — 37. FEDOTOVA T.K., BOROVKOVA N.P., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 3 (2011) 120 (in Russian). — 38. FEDOTOVA T.K., GORBACHEVA A.K., Pediatria. Zhurnal imeni G.N.Speranskogo, 6 (2014) 196 (in Russian). — 39. FEDOTOVA T.K., GORBACHEVA A.K., Anthropology in the Moscow University: to the MSU anniversary. Collection of the science articles. [Electronic source. Moscow: Science Research and Museum of Anthropology, Lomonosov MSU, Moscow, (2015) 105 (in Russian). — 40. FEDOTOVA T.K., GORBACHEVA A.K., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 4 (2016) 137 (in Russian). — 41. FEDOTOVA T.K., GORBACHEVA A.K., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 2 (2016) 39 (in Russian). — 42. FEDOTOVA T.K., STEPANOV A.A., BOROVKOVA N.P., Pediatria. Zhurnal imeni G.N.Speranskogo, 1 (2014) 146 (in Russian). — 43. CHESNIS G., Auxological characteristics of the Lithuanian children of the first year of life. PhD thesis. In Lithuania (Vilnius, 1970) (in Russian). — 44. CHESNIS G., Voprosy antropologii, 37 (1971) 92. (in Russian). — 45. CHESNIS G., FISHAS I., To the problem of the types of growth curves in the early postnatal human ontogenesis. In: Proceeding (conference of the Medical faculty of the Kapsukas Vilnius University, Vilnus, 1973). (in Russian). — 46. TANNER J.M., Acta Med.

Auxol., 26 (1994) 1. — 47. KURSHAKOVA YU.S., The quantitative conformities of the age changes of the anthropometric dimensions of children. In: Child growth and development. (Moscow, 1973). (in Russian). — 48. DUNAYEVSKAYA T.N., The morphological peculiarities and growth processes of children. In: Kurshakova Yu.S., Zenkevich P.I., (Eds) The size typology of the population of the countries-members of the CMEA. (Legkaya Industria, Moscow, 1974). (in Russian). — 49. DERYABIN V.E., Vestnik antropologii. Nauchniy almanac, 11 (2004) 120 (in Russian). — 50. Material on physical development of children and adolescents. Iss. 1. Ed.A.Ya.Goldfeld et al. Moscow: Medgiz, 1962. (in Russian). — 51. Material on physical development of children and adolescents of the cities and rural regions of the USSR. Moscow: Medicina, 1977. — 52. Material on physical development of children and adolescents of the cities and rural regions od the USSR. Iss IV. Part 1. The Russian Soviet Federative Socialist Republic. Moscow: All-Union Science Research Institute of Social Hygiene and ogranization of health protection, 1986 (in Russian). — 53. Material on physical development of children and adolescents of the cities and rural regions od the USSR. Iss IV. Part II. Moscow: All-Union Science Research Institute of Social Hygiene and ogranization of health protection, 1988 (in Russian). — 54. Material on physical development of children and adolescents of the cities and rural regions od the Russian Federation. Mosscow: Science Research Institute of Hygiene, economy and management of health protection, 1998. (in Russian). — 55. Standards on physical development of children aged 0–7 years and schoolchildren aged 8–17 years from Kazan (Methodical handbook for medicians, doctors of preschool child' institutions, school doctors, doctors on the hygiene of children and adolescents). Kazan, 1993. (in Russian). — 56. Physical development of the newborn of Kursk through 1929-1959 (methodic letter). Kursk, 1961. — 57. Physical development and health status of preschool children. Collection of Science works. Iss.II. Dyushambe, 1990. (in Russian). — 58. Physical development of children and adolescents of the Russian Federation. Collected articles. Iss. VI. Moscow: Publishing House «Pediatr», 2013. (in Russian). — 59. DAMBUYEVA I.K., The diversity of the anthropometric indices and polymorphic genes of the newborn. PhD thesis. In Russia (Moscow, 1970). (in Russian). — 60. Collaborators (794), A century of trends in adult human height. NCD Risr Factor Collaboration (NCD-RisC). Elife. 2016. — 61. *DERYABIN V. E., KRANS V. M., FEDOTOVA T. K., Journal of physiological anthropology and applied human science, 4(*2005), 487. — 62. SHMALGAUSEN I.I., Factors of the evolution. The theory of stabilizing selection. (Nauka, Moscow, 1968). (in Russian). — 63. GODINA E.Z., Auxology. In: Anthropology: Textbook for the students of educational institutions. (VLADOS, Moscow, 2003). (in Russian). — 64. *GODINA E.* Secular trends. In: M. HERMANUSSEN (Ed) Auxology. Studying Human Growth and Development. (Schweizerbart Science Publishers, Stuttgart, 2013). — 65. BODZAR B.E., SUZANNE C., Secular growth changes in Europe. (Eotvos Univ. Press, Budapest, 1998). — 66. The Cambridge Encyclopedia of Human Growth and Development / Ulijaszek S.J., Johnston F.E., Preece M.A. (eds.) (Cambridge University Press, Cambridge, 1998). — 67. WOLANSKI N., Rozwoj biologyczny czlowieka. Podstawy auksologii, gerontologii I promocji zdrowia. (Wydawnictwo Naukove PWN), 2012. — 68. PERMYAKOVA E. YU., GODINA E.Z., ZADOROZNAYA L.V., Aktualnie voprosi antropologii. Minsk: Belorusskaya nauka, 6 (2011) 122. — 69. PERMYAKOVA E. YU., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 2 (2016) 59 (in Russian). — 70. COLE T.J., Proc. Nutrition Society. Medline article, 2 (2000) 6. — 71. WESTERSTAHL M., BARNEKOW-BERGKVIST M., HEDBERG G., JANSSON E., Scand. J. of Medicine & Science in Sports, 2 (2003) 128. — 72. KRYST L., BELINSKA I., J Biosoc sci., 3 (2017) 380. — 73. BAZHIROVA M.S., The diagnostics of the form and dimensions of small pelvis of the pregnant and delivering women with the help of digital x-ray scanner. PhD thesis. In Russia (Moscow, 1989). (in Russian). — 74. GORBACHEVA A.K., DERYABIN V.E., FEDOTOVA T.K., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 2 (2009) 16 (in Russian). — 75. DEMARCHUK E.P., Anatomic-anthropological peculiarities of the organism and pelvic dimensions of women in the youth. PhD thesis. In Russia (Novosibirsk, 2004). (in Russian). — 76. KAARMA KH.T., The system of the anthropometric dimensions of women. (Valgus, Tallin, 1981). (in Russian). — 77. SAVCHENKO K.A., The changes of the female pelvic dimensions. In: Proceeding (The problems of physical anthropology of women, Tartu: TSU, 1980). — 78. YATZYK G.V., MALKOVA I.I., SYUTKINA E.B., Rossiyskiy pediatricheskiy zhurnal, 5 (2007) 10 (in Russian). — 79. YATZYK G.V., MALKOVA I.I., SYUTKINA E.B., Rossiyskiy pediatricheskiy zhurnal, 5 (2007) 4 (in Russian). — 80. SKVORTZOVA V.G., IVAZCHENKO S.N., Problems of the maternity and child protection, 9 (1977) 69 (in Russian). — 81. TOMAEVA K.G., The pregnancy proceeding and its outcome in the females with different somatotypes. PhD thesis. In Russia (St. Petersburg, 2011). (in Russian). — 82. FEDOTOVA T.K., GORBACHEVA A.K., Vestnik Moskovskogo Universiteta. Seria 23. Antropologia, 2 (2017) 26 (in Russian)

E. Godina

Institute and Museum of Anthropology, Lomonosov Moscow State University, Mokhovaya street 11, 125009 Moscow, Russia
e-mail:godina@antropos.msu.ru

SEKULARNI TRENDOVI U DJECE OD ROĐENJA DO TREĆE GODINE ŽIVOTA: META-ANALIZA PODATAKA IZ RUSIJE I SUSJEDNIH ZEMALJA

S A Ž E T A K

Cilj rada je istraživanje sekularnih promjena u glavnim antropometrijskim karakteristikama novorođenčadi, dojenčadi i djece u ranoj dobi, koristeći širok spektar urbanih uzoraka iz sadašnje Rusije i bivšeg SSSR-a i to kroz razdoblje od nekoliko desetljeća, od 1920. godine do danas. Studija sažima podatke o 338 novorođenčadi, 188 djece u dobi od 12 mjeseci, 168 djece stare dvije godine i 256 djece u dobi od tri godine. Sekularna dinamika duljine tijela opisuje proces značajnog povećanja skeletnog razvoja djece oba spola u svim razdobljima rasta. Taj se trend kombinira sa stabilnošću parametra tjelesne mase novorođenčadi i dojenčadi, značajnim porastom tjelesne mase u dobi od dvije godine i malim povećanjem dimenzije tijela kod trogodišnje djece. Vrijednosti opsega glave u novorođenčadi smanjuju se u razdoblju od 1950. do 2000. godine za 1,1–1,2 cm, što se može objasniti trendom smanjenja širine zdjelice u majki koji se spominje u literaturi. Taj se trend potpuno zaustavlja do kraja prve godine života, a u dobi od 12 mjeseci dolazi do sekularne stabilnosti ovog parametra. Opsezi glave i prsa u dvo- i trogodišnje djece stabilni su kroz promatrano vremensko razdoblje.