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Secular changes of pelvis in Croatian perinatal women



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ABSTRACT

The goal of the study was to examine secular changes of pelvic size in parturient women over the 25-year period from 1985 to 2009. Data were collected from randomly selected patients' medical records of 2414 parturient women from four time periods (1985–1986, 1992–1994, 2000–2002, and 2007–2009). Three different pelvic measurements were collected: *distantia spinarum*, *distantia cristarum*, and *distantia trochanterica*. Regression analyses were conducted in order to test predictors of pelvic dimensions. The multivariate analysis of covariance (MANCOVA) was used to test changes in pelvic dimensions over time, with body mass index (BMI) as a covariate.

The average size of *distantia spinarum*, *distantia cristarum*, and *distantia trochanterica* was 249.3 mm ($SD = 13.7$), 277.9 mm ($SD = 15.6$), and 318.3 mm ($SD = 19.6$), respectively. Pelvic dimensions were all positively related to woman's height and pre-pregnancy weight. After controlling for the BMI, there were significant changes in pelvic dimensions over the 25-year period and it was shown that *distantia spinarum*, *cristarum*, and *trochanterica* all increased ($F [3,2408] = 16.4$, $p < 0.01$), especially from the 1992–1994 period to the present.

To conclude, parallel with secular changes of weight and height in parturient women, changes in bones are also evident. The size of pelvis in parturient women had significantly enlarged over the 25-year period.

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S A Ž E T A K

Cilj ovog istraživanja bio je ispitati sekularne promjene zdjelice kod rodilja tijekom 25-godišnjem razdoblju, od 1989. do 2009. Podaci su prikupljeni iz slučajno odabranih povijesti bolesti 2414 žene koje su rodile u četiri intervala (1985.–1986., 1992.–1994., 2000.–2002., i 2007.–2009.). Tri različite mjere zdjelice su uzete u obzir: *distantia spinarum*, *distantia cristarum* i *distantia trochanterica*. Regresijske analize su napravljene kako bi se ispitali prediktori veličine zdjelice. Multivarijatnom analizom kovarijance (MANCOVA) testirane su razlike u veličini zdjelice u četiri ispitivana intervala, pri čemu je indeks tjelesne mase korišten kao kovarijata.

Utvrđene su prosječne vrijednosti mjera zdelica pri čemu *distantia spinarum*, *distantia cristarum* i *distantia trochanterica* iznose 249.3 mm ($SD = 13.7$), 277.9 mm ($SD = 15.6$), i 318.3 mm ($SD = 19.6$). Sve mjere zdjelice su u pozitivnoj korelaciji s ženinom visinom i masom prije trudnoće. Nakon što se kontrolira indeks tjelesne mase, utvrđeno je da postoje značajne promjene u veličini zdjelice tijekom 25-godišnjeg razdoblja te da su se *distantia spinarum*, *cristarum* i *trochanterica* sve povećale ($F(3, 2408) = 16.4$, $p < 0.01$), posebno od razdoblja 1992.–1994. nadalje.

Zaključno, u skladu sa sekularnim promjenama u masi i visini, promjene u koštanim strukturama su također prisutne. Veličina zdjelice kod rodilja se značajno povećala tijekom 25-godišnjeg razdoblja.

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Introduction

In the last few decades there have been interesting changes of constitutional human characteristics associated with rapid industrial development, higher standard of living, new human habits such as the use of vaccinations, and more advanced and accessible health care. Human occupations and lifestyles have also been changing and in great number of studies it has been investigated how these changes affect health.

In the 20th century, it has been noted that people in some countries are becoming taller from generation to generation. This increase was observed in various age groups from early childhood to adult age. At adulthood, the reported increase in height for various populations ranged from 2 mm to 20 mm per decade, with slightly higher values in developed countries (Eisenmann et al., 2000; Łaska-Mierzejewska and Olszewska, 2006). Another notable change that has been present in the modern world with raising frequency is fatness. Percentage of obese and overweight people has been in the increase lately, as well as the percentage of obese children in the population (Tzotzas and Krassas, 2004).

Along with all the changes of human constitutional characteristics, it is expected for birth canal characteristics in women to undergo changes as well. Since the structure of the birth canal is extremely important for a successful vaginal delivery, it is crucial to estimate the normality and size of a pelvis. In order to assess the pelvic size in our everyday practice at the Department of Obstetrics and Gynecology, University Hospital Center 'Sisters of Mercy' we take several selected anthropometric measurements such as interspinous distance, intercrystal distance, intertrochanteric distance, and external conjugate. These measurements are performed according to Baudeloque's technique with a pair of large spreading calipers.

Interspinous distance or *distantia spinarum* is the distance between both of the anterior superior iliac spines and is approximately 250–260 mm long in a normal pelvis. Intercrystal distance or *distantia cristarum* is the distance between the furthest lateral points of the two iliac crests and is 280–290 mm on average. Intertrochanteric distance or *distantia trochanterica* is the distance between the greater

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