

CHANGES OF THE GENERAL BONE STATUS IN THE MENOPAUSE TRANSITION

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The purpose of the research was to study the relationship between the menopausal status (estimated by the reproductive and menstrual history as well as the level of female sex hormones) and the general bone status (characterized by bone structure and bone mass) in Hungarian women. A random sample of 2602 Hungarian women (aged 40–65 years) was to be enrolled in the study between 2011 and 2013. By considering the reproductive and menstrual history subjects were divided into premenopausal, early perimenopausal, late perimenopausal and postmenopausal subgroups. In a subsample of 150 subjects salivary estrogen and progesterone levels were determined by 17 beta-Estradiol Saliva Elisa and Progesterone ELISA immunoassays. Bone mass was estimated by Drinkwater-Ross four-component method. The bone SOS and BUA bone structural parameters were assessed by using the DTU-one osteometer. Hypotheses were tested at the 5% level of random error. By comparing the menopausal status estimation methods in the studied subsample, the reproductive and menstrual history was found to be a more reliable estimator of the menopausal status than the sex hormone levels (that are having considerable daily fluctuation also in a normal menstrual cycle) determination. Former epidemiological studies suggest that the menopause transition is associated with significant changes in bone structure. Our results evidenced these significant changes in body structure by reproductive ageing in women, but an important shift between the changes in bone mass and the bone structural parameters (SOS and BUA) was found. This could imply that (1) bone system changes not only in its absolute mass, but also in its structure in the perimenopausal period, and (2) the onset of these bone structural changes in the skeletal system and the intensity of these changes differ in the menopause transition. In general, the earlier onset of menopause the more pronounced changes were found in these trends of bone structure by reproductive ageing. The study was supported by the Hungarian National Foundation for Science (OTKA grant K83966).

Key words: *menopause, body structure, bone mass; Hungarian women*

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PHYSIOLOGICAL VARIATION ASSOCIATED WITH FRAILTY AMONG OLDER RESIDENTS OF HIGHER ALTITUDE VILLAGES OF THE SELŠKA VALLEY

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Frailty is the multi-system dysregulation following multiple life stressors that is associated with age and increases an individual's vulnerability to negative health effects (Fried et al 2001). One of the most critical questions frailty research seeks to answer is to what extent biocultural variables predict frailty. In the model employed in this paper, endogenous variables that individuals cannot control, such as age and sex, affect exogenous variables that are a result of individuals' lifestyles (Fried et al., 2001). These variables then affect frailty, as assessed by a five-factor frailty index developed by Fried et al. (2001) and Walston (2005). Previous research that also employed this index studied mostly North American populations and found associations between education level, age, sex, prevalence of certain diseases and levels of frailty (Fried et al., 2001, Walston, 2005). This paper broadens the range of variables studied, and expands the demographic and cultural scope of frailty research by applying the frailty index to a geographically isolated Slovenian population. Data were obtained from 40 participants aged 55 years and older during fieldwork in

2008 and 2009 in the Selska Valley, Slovenia. Of participants, 26 were women (ages 59–86) and 14 men (ages 57–82). Self-report data and physical assessments were recorded for each individual. We used linear regression to explore associations between frailty and these variables. Significant associations ($p=0.05$) were found between frailty and age, being female, height, length of residence in the village, self-reports of negative health effects including poor overall health, feeling tired, and negative future health expectations. When effects of age and sex were controlled, significant associations were again found between frailty and multiple self-reports of poor health and painful or reduced activity level. In conclusion, this paper explores possible interactions of lifestyle factors and frailty across cultures and calls for further cross-cultural frailty research.

Key words: *physiological variation, frailty, old people, Selška valley, Slovenia*

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REPRODUCTIVE HISTORY IN RELATION TO FATNESS IN THE MENOPAUSE TRANSITION

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The occurrence and the timing of the reproduction-related events, as menarche and menopause, as well as the characteristics of menstrual cycles and reproductive life, as gestations, lactation, child-caring behaviour, etc. are mainly controlled by the neuroendocrine system. The progressive and regressive changes of the neuroendocrine system through the female life cycle contribute not only to the age-changes of the reproductive system and reproductive behaviour but also to considerable changes of the female body structure. The importance of studying the relationship between the reproductive variables (age at menopause, characteristics of menstrual cycles, fertility) is increasing nowadays, since (1) many diseases (e.g., obesity, cardiovascular disorders, breast, ovarian and uterine cancers, etc.) seem to be related to the characteristics of reproductive life and (2) the increasing knowledge about this complex relationship could help to improve the effectiveness of the health prevention programs. The main purpose of the present analysis was to analyze (1) the relationship among some indicators of reproductive history in women (aged 40–65 ys), and (2) the reproductive variables in relation to the characteristics of fatness indicators (fat mass and its distribution) in the menopause transition. Data on the age at menarche and menopause, the pattern and regularity of menstrual cycles before and during menopause, the number and timing of pregnancies and their outcomes, the incidence of breast feeding, the regularity of menstruation, gynaecological or obstetric problems and contraceptive usage were collected by questionnaires. Salivary progesterone and estrogen (as 17beta-estradiol) levels were assayed using IBL ELISA kits. Subjects were divided into premenopausal, early and late perimenopausal as well as postmenopausal subgroups on the basis of the menstrual cycle characteristics and sexual hormone levels. The main results of the present analysis of the relationship between the reproductive factors and fatness indicators during the menopause transition revealed that (1) age at menarche did not show any association with subsequent fatness, nor did age at menopause; and (2) parity, menopausal status and the age at menopause were associated with the fatness indicators. The study was supported by the Hungarian National Foundation for Science (OTKA grant K83966).

Key word: *menopause, menarche, body fatness, Hungarian women*

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