

MONITORING HEART RATE FOR EVALUATING THE INTENSITY OF PHYSICAL ACTIVITY UNTO PREGNANT WOMEN

Preliminary communication

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Abstract

Physiological changes are particularly important in cardio-respiratory functions for every pregnant woman; these changes can affect her reactions to physical exercises in gymnastics. Heart rate (HR) of pregnant women is in between normal range in gymnastic activities; the heart rate is controlled by the volume and intensity of exercises. It is recommended for pregnant women to apply appropriate activities and forms of training for stimulating heart rate, for maintaining good tonus and good mood in everyday life.

Keywords: *Gymnastics, pregnancy, recreation, wellness exercise, physical activity, Wellness tourism, physical activity in aquatic environment,*

INTRODUCTION

Short-term pulse dynamics show no risk for pregnant women, in contrast with the increasingly higher hemodynamic demands on current adaptations (Pena et al., 2011).

Good alternative would be Recreation practices during the pregnancy. They can be regarded, as defined by Dimitrova (Димитрова), (2009) in her research "... developing a polyvalent SPA culture. It is important by Dimitrova (Димитрова), (2012) to "...discuss issues with remedial influence like the physical activity in aquatic environment and the immediate connection with the improvement of quality of life and health status for the participants ". The dynamics of the SPA & Wellness tourism on the demand for specialized packages outstrips (Polimenov, (Полименов), 2013) with great growth rates operation of services with qualified personnel certified through educational programs (Dimitrova, (Димитрова), 2006; Dimitrova, 2014), The quality services for pregnant women, required staff with fellowships, training seminars or received certified competencies (Dimitrova, (Димитрова), 2011; Dimitrova, 2014),.

Heart rate monitoring is widely used in sports practices and for research purposes, yet data for its usage with pregnant women during exercises is rather scarce and insufficient (Cavalcante, Cecatti, Pereira, Baciuk, Bernardo, Silveira, 2009; Nesheva, Pavlova, Fenerova, Georgiev, 2011).

The complexity of heart rate (HR) regulation mechanisms in pregnant women does not seem to increase the HR during mid-pregnancy regardless the force of regulatory interactions. The short-term dynamics of pulse have no risk for pregnant women in spite of the increasingly higher hemodynamic demands for current adaptations (Pena, Echeverria, Garcia, Ortiz, Martinez, Vargas-Garcia, Gonzalez - Camarena, 2011).

Other group of authors, undergoing variable studies, determine HR dynamics as being variable with

low and high frequencies at the end of pregnancy (Yeh, Shieh, Chen, Kuo, 2009).

The physiological changes in cardio-respiratory functions of the pregnant woman are particularly important - they can affect her reactions to physical exercises in gymnastics. When pregnant women are added and enlisted to an exercise program, published guidance of recommendations must be rigorously and carefully followed. Here is a list of authors: Guelfi, Halse, 2013; Nesheva, Pavlova, Fenerova & Georgiev, 2011. Their mutual and essential element is the intensity control, control of the physical activity. For this purpose it is highly recommended to use the scale of Borg, the test with talking - the word test, and the pulse zone. They should be modified accordingly with the changes in HR occurring during pregnancy. For the measurement of HR, different heart rate monitors are applied (Larsson & Lindqvist, 2005). In recent years devices with similar features but with more compact dimensions have been created, for example the system Suunto Memory Belt (Suunto Oy).

Pulse rate should *not exceed 150 beats / min* (ACOG, 2002; Spatling, Fallenstein, Huch, huch, & Rooth, 1992).

Conducted from the literature research made upon clinical studies on pregnant women it was established that there is very little data on the usage of specialized equipment to capture the heart rate.

A key component in the methodology of our study is the realization of functional control for assessing and evaluating the intensity of the applied and practised gymnastic activities in Nesheva Program for pregnant women in relevance with the approved and established recommendations for (accepted) levels of physical activity for pregnant women. The objective method used for assessing the intensity of gymnastics for pregnant women is heart rate monitoring. Heart rate monitors are widely used in sports practices and for research purposes, yet - data on their usage with

pregnant women during exercising is rather scarce and insufficient (Cavalcante, Cecatti, Pereira, Baciuk, Bernardo, & Silveira, 2009).

RESULTS

A research has been done on 6 women (III-rd trimester) with normal pregnancy (age 29 ± 1.84 g.; height 165 ± 10.01 sm.) through the "experiment - an example". Descriptive statistics characterize the data set out in Table 1; the values presenting (Mean \pm SD) the heart rate are before and after exercises in gymnastics for pregnant women.

Histograms are shown on figure. 2 They have one peak symmetrical distribution of pulse rate in IT (Mean - 87,9) and FT (Mean - 90,54).

Aggregated, the given data submit complex of reasons to conclude that women with their pregnancy progression maintain their functional reserve. The already applied and practiced model "Nesheva Program" for women with normal pregnancies activates the

appropriate cardio-respiratory functions; all functions quickly recover to baseline after exercises, differences are not significant ($p > 0.05$).

STUDY RESULTS OF HR IN ONE GYMNAS TIC EXERCISE

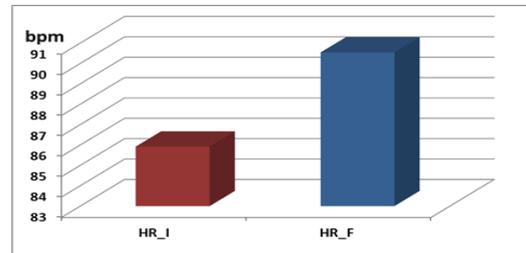


Figure 1: Comparison between IT (primary research), FT (final research) heart rate.

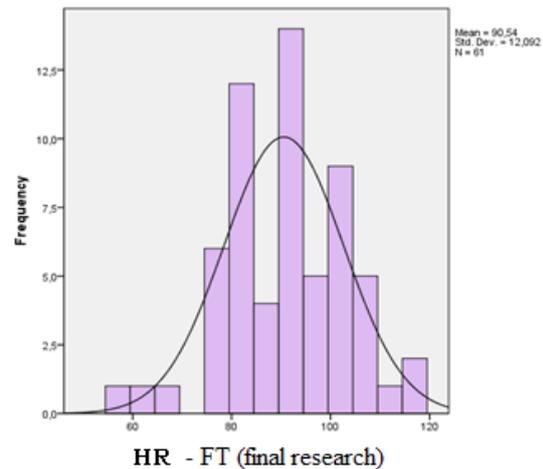
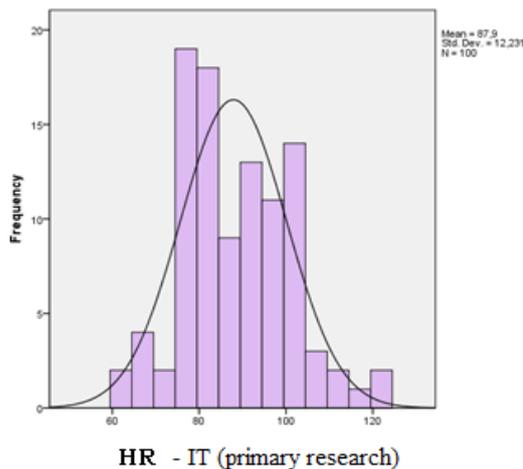


Figure. 2 "Graph Gaus" of HR at the beginning and at the end of research.

CONCLUSIONS

1. Heart rate (HR) of pregnant women is in between normal range in gymnastic activities; the heart rate is controlled by the volume and intensity of exercises.

2. The examined results give reason to estimate and accept that practicing gymnastic components for pregnant women is very good to adapt without any risk.

RECOMMENDATION

It is recommended for pregnant women to apply appropriate activities and forms of training for stimulating heart rate, for maintaining good tonus and good mood in everyday life, activities that hold as priority health effect for pregnancy.

REFERENCES

ACOG - AMERICAN COLLEGE OF, O. & GYNECOLOGISTS. 2002. Exercise during pregnancy and the postpartum period. *Obstet Gynecol*, 99, 171-173.
Cavalcante, S. R., Cecatti, J. G., Pereira, R. I., Baciuk, E. P., Bernardo, A. L. & Silveira, C. (2009). Water aerobics II: maternal body composition and perinatal outcomes after

a program for low risk pregnant women. *Reprod Health* 6, 1, 78-83.

Димитрова, Б., & Донеv, Ю. (2006). *Плуvни спортове в училище*. Монография. [Swimming sports in school. In Bulgarian.] София: Издателство Авангард Прима.

Димитрова, Б. (2009). *SPA култура и аква практики*. Учебник за ОКС „Магистър“. [SPA culture and aqua practices. In Bulgarian.] София: Издателство Авангард Прима.

Димитрова, Б., & Деде, Н. (2011). Акваспининг като антистресова превенция на здравето [Aqua spinning as anti-stressing health prevention. In Bulgarian.] *Сборник, Трета международна научна конференция, София, 2011, "Оптимизация и иновации в учебно-тренировъчния процес"* (pp.146-153). Софийски университет „Св. Климент Охридски“, Департамент „Физическо възпитание и спорт“. София: Университетско издателство „Св. Климент Охридски“.

Димитрова, Б. (2012). *Аква практики* [Aqua practices. In Bulgarian.] София: Издателство Авангард Прима.

Dimित्रова, В. (2014). The enotherapy as an effective financial instrument for the wine tourism. *Proceedings, International Scientific Conference for Tourism "SPA and wine"- part of the Culture corridor – cultural routes* (pp. 55-61). Blagoevgrad: Faculty of Economy, Tourism depart-

- ment. SW University.
- Guelfi, K. J. & Halse, R. E. (2013). Moderate-intensity exercise affects perceived hunger and fullness but not appetite-related hormones in late pregnancy. *Appl Physiol Nutr Metab*, 38, 1162-1165.
- Larsson, L., & Lindqvist, P. G. (2005). Low-impact exercise during pregnancy a study of safety. *Acta Obstet Gynecol Scand*, 84, 34-38.
- Mottola, M. F. (2012). Exercise during pregnancy: reviewing the PARmed-X for pregnancy guidelines. *The Canadian Journal of Diagnosis*, 29, 70-72.
- Nesheva, I., Pavlova, E., Fenerova, D., & Georgiev, M. (2011). Gymnastics Program Model and some Physical Ability Tests in Normal Pregnancy Females, *Proceedings, V International Congress People, Peter-burg, 2011, "Sport and Health"* (pp. 367- 372). Saint-Peterburg: Ed. Sport and Health.
- Pena, M. A., Echeverria, J. C., Garcia, M. T., Ortiz, M. R., Martinez, A., Vargas-Garcia, C., ... Gonzalez-Camarena, R. (2011). Short-term heart rate dynamics of pregnant women. *Auton Neurosci*, 159, 117-122.
- Полименов, М. (2014). *Иновации в ресторантьорството* [Innovations in restaurant management. In Bulgarian.] София: Авангард Прима.
- Spatling, L., Fallenstein, F., Huch, A., Huch, R., & Rooth, G. (1992). The variability of cardiopulmonary adaptation to pregnancy at rest and during exercise. *Br J Obstet Gynaecol*, 99(Suppl. 8), 1-40.
- Yeh, R. G., Shieh, J. S., Chen, G. Y., & Kuo, C. D. (2009). Detrended fluctuation analysis of short-term heart rate variability in late pregnant women. *Auton Neurosci*, 150, (2), 122-126.

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