

## **Opponent's review**

PhD thesis Dr. Guey-Shiann Yang

### **"Selected Differences in Pathophysiology of Cardiovascular System in Women "**

Presented thesis has 144 pages, including bibliography, attached are author's publications related to the topic of the work. It is divided in conventional manner and is sufficiently documented with tables and figures.

In the first chapters the author introduces the main issues of sex differences in the pathogenesis and prognosis of cardiovascular disease. Special attention is paid to the question of the role of sex hormones in these differences; the author in more details focuses on gender differences in the pathogenesis and prognosis of cardiac arrhythmias and describes the historical development of specific electrophysiological tests and procedures used in the diagnostics and interventional treatment of arrhythmias.

The next part is dedicated to the aims and protocol of the project. The following chapters concentrate on the results of two clinical studies. The first one describes the differences in electrophysiological and electro-anatomical characteristics between men and women in the group of 93 patients with ventricular tachycardia originated from the outflow tract of the right ventricle. Women had significantly narrower QRS complex, smaller mean voltage and multiple zones with low voltage. No sex differences were found in the results of ablation of ventricular tachycardia in more than two years of follow-up.

The second study is focused on the comparison of the heart rate variability in the group of 925 premenopausal women, postmenopausal women without hormone replacement therapy, women with estrogen replacement and women with substitution of estrogen-progesterone and in men of the same age. The authors found that the heart rate in postmenopausal women on estrogen therapy is comparable to men and significantly lower than in the other groups. Women with estrogen replacement have similarly to premenopausal women significantly lower low frequency and higher high-frequency power compared with the other groups showing greater parasympathetic

activity and lower sympathetic activity in women before menopause or with postmenopausal estrogen replacement.

The following chapters comprise the discussion of the results, conclusions, a list of abbreviations, references and a list of author's publications related to the topic of the work.

I have a few comments to the submitted thesis. First of all, I would like to mention the unusually extensive introductory section, forming a larger part of the thesis; the author in the introduction often turns to the issues unrelated to the topic of the project and some passages are used repeatedly. Regarding the results, I disagree to label the observational studies as "experiments", but otherwise the two studies are well performed and bring priority and unique results.

I have the following questions:


1. Do you believe in a beneficial and protective effect of estrogen administration as hormone replacement therapy after menopause?
2. Do you think that the protective cardiovascular effects of estrogens are mediated rather by parasympathetic activation or by suppression of sympathetic activity?

### **Conclusion**

The thesis by Dr. Guey-Shiann Yang focuses on the important topic of the sex differences in cardiovascular disease. The work brings priority results, the author is well oriented in the complex issues and demonstrated the ability to conduct independent scientific work. I suggest therefore that the thesis should be submitted for defense and become the basis for the award of the title

***PhD in human physiology and pathological physiology***

Prague, 28 February 2017



**Doc. MUDr. Petr Ošťádal, Ph.D.**