

Opponent's review about the master thesis

Author of the thesis **Bc. Zaid Al Boloushi**
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 Title of the thesis **Hyperbaric Oxygen Therapy in Relation to
 Production of Free Radicals "Oxidative Stress"**

Volume of the thesis Text pages 115, figures 18, tables 5,
 quotations of literature works 97, appendices 4.

The author reminds his own experience from the sea diving and from the work in Hyperbaric Chamber Department of the Kladno Hospital and continues in the extensive research of available scientific literature dealing with hyperbaric oxygen treatment of diseases. He describes the inhalation of 100% oxygen in the hyperbaric chamber causing the increase of oxygen tension in blood and in tissues. This process increases not only the oxygenation, but also the angiogenesis and decreases the building of gas bubbles in the blood during decompression. But after longer time, the *hyper oxygenation* may happen which causes the increase of the CO₂ volume, shifting of pH to the acidity and increasing of free radicals level which may endanger the tissues. He describes the symptoms of hyper oxygenation.

The author searches in the literature positive affects as well as the negative ones of hyperbaric oxygenation, compares and comments these effects.

He mentions the indications of the hyper baric oxygen treatment as well as absolute and relative contraindications. He closes the research with this result: the hyperbaric oxygen treatment shows to be promising in diabetes mellitus in cosmetic surgery, in strokes and in swelling of the brain. The combination of negative effect with antioxidants is not yet exactly known.

Some comments to the text. The list of abbreviation is incomplete and not alphabetical which complicates the searching. Some text parts are repeated in full text. There are present some typist's errors. The discussion with people from hyperbaric chamber department is not visibly involved in the text.

Question of the opponent: The toxicity of hyper oxygen treatment was proved by Jain (2004). I ask whether this HBO treatment can provoke the epileptic paroxysms even in treated epileptic patients because the excitability of CNS increases by hyperbaric oxygen treatment and reduce so the treatment effect of medicament used in epilepsy. Is the dosage of the HBOT generally close set or must be adapted to the individual state of the intern milieu of the patient?

The overall assessment

The thesis is a vast research work. The introduction is very detailed which enables the understanding of biochemical processes even to lay persons. Author compiled the great quantity of clinical observations and data to the problem of hyperbaric oxygen treatment. He evaluates all gathered observations from five standpoints and comments these data critically. He tries to find out the positive effects of the treatment as well as negative ones and tries to set the objective future perspective of this treatment method in medicine and in specialized professions. The discussion is exhaustive dealing with many possible complications.

In the comprehensive research are included also many experiments on animals, clinical experiments and personal experiences. The author tries to be objective and critical to the results of experiments and personal experiences. He proposes also recommendations to the future research. He discusses the possible toxicity of free radicals released by the hyperbaric oxygen therapy and possibility of treatment of this fact.

The thesis gathers the great number of knowledge of the hyperbaric oxygenation therapy from the first sources recorded in 1662 till 2008. The thesis is profitable not only for physiotherapy but also for internal medicine, surgery and neurology.

The thesis conforms to all requests demanded for the magister thesis and therefore I recommend the thesis to be publicly disputed and after being defended to be accepted as the fulfilled requested part necessary to the state examination for the master degree. ~~Then~~ mark: excellent (A)

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