



Opinion on the use of a pressure chamber by athletes

The pressure chamber makes it possible to change the atmospheric pressure at which a human is staying. In addition, you can also change the composition of the air inside the chamber by manipulating the proportions of oxygen, nitrogen, carbon dioxide and hydrogen. Depending on the settings used, the chamber can be used for various purposes to help an athlete achieve the best results.

Hyperbarism, i.e. the use of elevated atmospheric pressure, especially in combination with hyperoxia, i.e. increased oxygen content, are to increase the oxygen supply in tissues, and thus accelerate the regenerative processes of the body. The increased hydrogen content has hypothetically reduced oxidative stress, which is even more important in the case of parallel hyperoxia.

Reverse actions, possible to implement using the same chamber, i.e. lowering the pressure and possible reduction of oxygen availability by increasing the percentage of nitrogen in the air, make it possible to simulate mountain conditions, and thus to implement all variants of altitude training. What makes it unique is the possibility of using hypobaric hypoxia (with reduced pressure, as in real mountains), which is not equipped with tents, rooms or portable hypoxia devices (all of them use reduction of oxygen content by replacing it with nitrogen at unchanged atmospheric pressure).

The use of hyperbarism, especially in disciplines related to the repeated landings after jumps, like volleyball or handball, is recommended based on the results of research by Shimody et al. (2015).

Accelerated healing under the influence of hyperbarism and hyperoxia, following muscle injuries caused by eccentric efforts, has not been confirmed (Mekjavic et al. 2000, Harrison et al. 2000, Babul et al. 2003). However, there are no newer works on this subject, and none of the above has changed the hydrogen content. Based on the results of the recently published research, it is suggested that an increased availability of hydrogen can have a beneficial effect on the muscles (Huang et al. 2015, Hasegawa et al. 2017).





The risk of using the hyperbaric chamber is pressure damage of the middle ear, which can be counteracted but, unfortunately, it is difficult to predict who will experience it (Commons et al. 2013). The solution minimizing this risk is the vestibule of the chamber (airlock) and correspondingly slow pressure change during entering and exiting the chamber. The contraindications to the use of the hyperbaric chamber are febrile states, active upper respiratory tract infections and conditions associated with pneumothorax and emphysema.

The pressure chamber Ekonstal type KI V120 offers a relatively safe pressure range up to 1500 hPa; higher pressures are associated with a significant increase in the risk of complications and require much longer adaptation in the airlock.

Summing up, the possibility of using the pressure chamber in one of the Olympic Preparation Centers of the Central Sports Center, for example in Spała, where volleyball and light athletes often train, would create an opportunity to use new resources to help post-workout renewal and training. In addition, it would enable unique studies on the combined use of hyperbarism, oxygen therapy and increased availability of hydrogen.

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