

Pengaruh Paparan Hipoksia Hipobarik Intermiten terhadap Kadar Malondialdehid pada Jaringan Paru Tikus Sprague-Dawley = Effect of Intermittent Hypobaric Hypoxia Exposure on Malondialdehyde Levels in Lung Tissue of Sprague-Dawley Rats

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Abstrak

Hipoksia hipobarik merupakan kondisi ketika konsentrasi oksigen mengalami penurunan seiring bertambahnya ketinggian. Fenomena ini dapat memicu stres oksidatif melalui peningkatan produksi radikal bebas yang menyerang komponen molekuler. Paparan hipoksia hipobarik intermiten (HHI) disinyalir dapat melatih kemampuan adaptasi jaringan sehingga menjadi lebih toleran terhadap kondisi hipoksia. Penelitian eksperimental ini menggunakan 30 tikus Sprague-Dawley jantan yang dibagi menjadi 6 kelompok, yaitu kelompok kontrol dan kelompok yang mendapat perlakuan selama 1, 7, 14, 21, dan 28 hari. Pemberian paparan hipoksia hipobarik setara 10.000 kaki (523 mmHg) dilakukan setiap hari selama satu jam dengan menggunakan hypobaric chamber. Kadar malondialdehid (MDA) setiap sampel kemudian diukur dengan melakukan metode Wills yang dibaca dengan menggunakan spektrofotometer pada panjang gelombang 530 nm. Rata-rata kadar MDA secara perlahan mengalami penurunan pada kelompok yang terpajan hipoksia hipobarik intermiten ketika dibandingkan dengan kelompok yang terpajan hipoksia hipobarik akut. Meskipun uji statistik menunjukkan bahwa perubahan ini tidak signifikan, paparan hipoksia hipobarik intermiten setara 10.000 kaki selama satu jam per hari dapat memengaruhi kadar MDA di jaringan paru tikus Sprague-Dawley.

.....A condition known as hypobaric hypoxia occurs when the concentration of oxygen falls with increasing altitude. This phenomenon can trigger oxidative stress through increased production of free radicals, which damage molecules. It is believed that exposure to intermittent hypobaric hypoxia (IHH) can train tissue adaptation mechanisms, increasing the tissues' tolerance to hypoxic environments. Thirty male Sprague-Dawley rats were utilized in this experiment as they were split into six groups: the control group and the groups that were exposed to IHH for 1, 7, 14, 21, and 28 days. Using a hypobaric chamber, exposure to hypobaric hypoxia equal to 10,000 feet (523 mmHg) was done once a day for an hour. The malondialdehyde (MDA) levels of each sample were measured using the Wills method which was read using a spectrophotometer at a wavelength of 530 nm. Compared to the acutely exposed to hypobaric hypoxia group, the average MDA level gradually decreased in the group that was exposed to intermittent hypobaric hypoxia. Despite the insignificant result, exposure to intermittent hypobaric hypoxia equivalent to 10,000 feet for one hour per day can affect MDA levels in the lung tissue of Sprague-Dawley rats.