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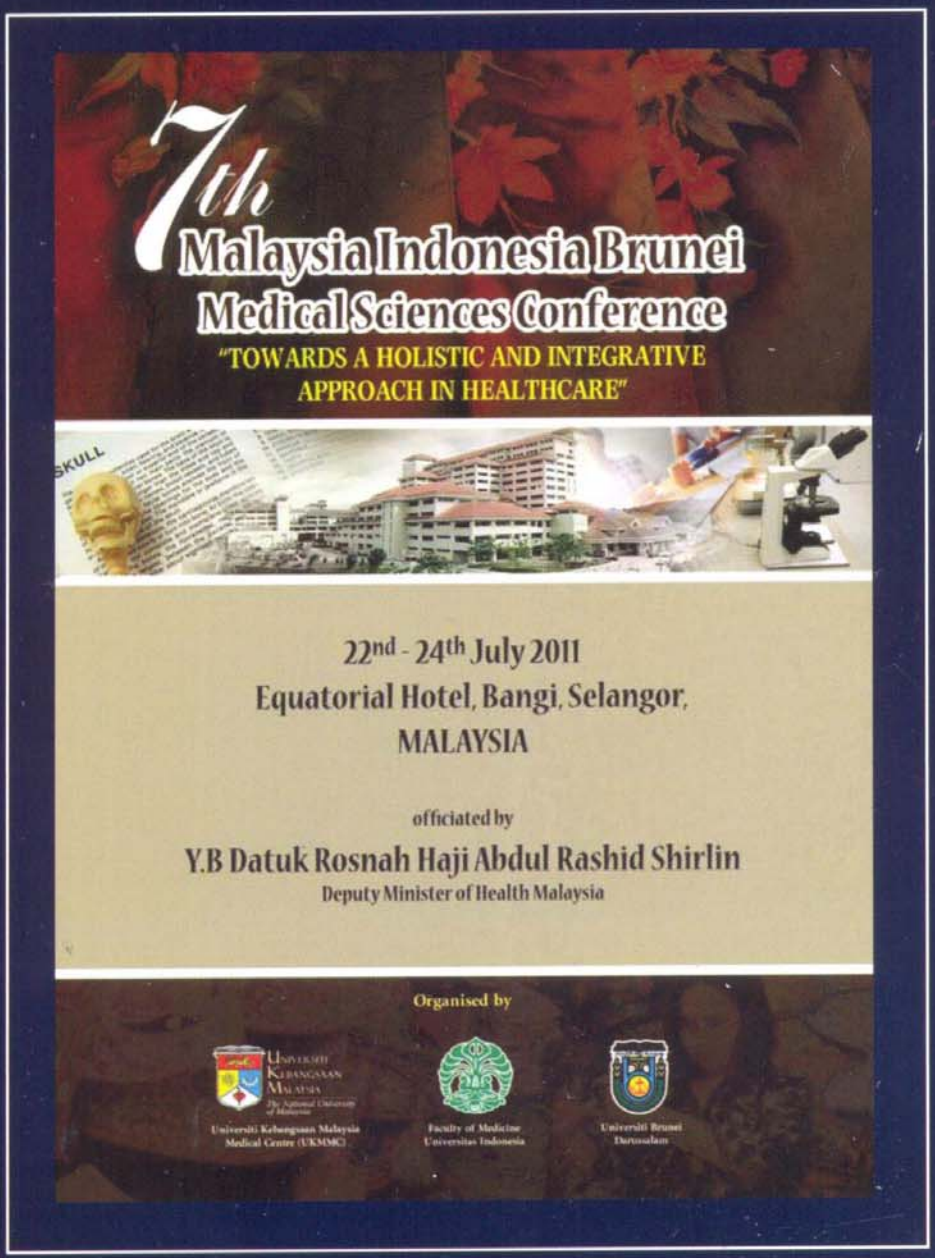

THE EFFECT OF ACUTE INTERMITTENT HYPOBARIC HYPOXIA EXPOSURE ON THE CARBONYL CONCENTRATION AS OXIDATIVE STRESS MARKER IN VITAL ORGANS OF RATS

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Background:
Hypobaric hypoxia is commonly experienced by the air force army when they undergo simulation training inside the hypobaric chamber. The effect of hypobaric hypoxia to human body is still unclear although some studies have suggested that oxidative stress process occurs in rats exposed to hypobaric hypoxia. This research aim is to analyze the protein peroxidation level through carbonyl concentration of the vital organs, namely the brain, heart, kidney, and liver of rats exposed to acute intermittent hypobaric hypoxia exposure through the hypobaric chamber training program.

Materials and Methods:
The research design is experimental with the sample of five group of rats each containing five male Wistar rats. The first group is the control group with no exposure whereas the rest were exposed to once, twice, three, and four times hypobaric chamber training procedure respectively. Vital organs were harvested and carbonyl concentration was measured with spectrophotometer after derivatized by a series of biochemical reaction with DNPH reagent.

Results:
There was different variation of trend among the carbonyl concentration between the brain, heart, kidney, and liver of rats but generally they increase upon the first exposure and will decrease at the next exposure, suggesting possibility of adaptive mechanism towards free radical damage. Brain and heart seemed to respond the earliest with brain reaching significantly lower carbonyl after four exposures. The kidney responded and adapted slower to hypobaric hypoxia whereas the liver seemed to be able to induce adaptive mechanism without having to be extensively damaged by oxidative stress prior to the adaptation, unlike the other organs.

Conclusion:
It can be concluded that acute intermittent hypobaric hypoxia exposure through hypobaric chamber training procedure may be beneficial by inducing an adaptive response in the vital organs toward oxidative stress, so that less extensive oxidative damage in the cell would occur on the subsequent exposures.

Keywords:
acute intermittent hypobaric hypoxia, carbonyl concentration, oxidative stress, vital organs