ABSTRACT

THE EFFECT OF THE LENGTH OF 2-Methoxyethanol ADMINISTRATION ON RATS' (*Rattus norvegicus*) SPERM MEMBRANE ULTRASTRUCTURE AND INTEGRITY

The compound 2-ME that enters the body is oxidized into metoxyaldehyde (MALD) using alcohol dehydrogenase as catalyst. MALD is subsequently oxidized into metoxyacetate acid (MAA) with aldehyde dehydrogenase as catalyst. MAA has a characteristic of a strong oxidant and may induce oxidative stress in spermatozoa. This study used male *Rattus norvegicus* aged 3 months with bodyweight of 125-135 gr. 2-ME dose given was 200 mg/kg bw/day subcutaneously for 1 day, 3 days, 6 days/1 week, 12 days/2 weeks in treatment group and physiological salt solution to control group. Spermatozoa were taken from epididymal cauda.

Observation was carried out to each 100 spermatozoa, and then the percentages of membrane integrity as well as normal morphology of rats' spermatozoa were calculated. The ultrastructure was analyzed qualitatively. Results of observation showed that 2-ME was able to induce reduction in the spermatozoa membrane integrity and normal morphology in rats, and the longer the administration the more the reduction in the percentage of membrane integrity and normal morphology of rat's spermatozoa. Observation to the ultrastructure of rat's spermatozoa showed damage in membrane and mitochondria after being exposed to 2-ME for 12 days/2 weeks. In conclusion, 2-ME administration results in the reduction of rat's spermatozoa membrane integrity, rat's spermatozoa normal morphology, and the damage in rat's spermatozoa membrane ultrastructure and mitochondria, leading to the reduction of sperm quality.

Keywords: 2-ME, MAA, membrane integrity, spermatozoa morphology and ultrastructure