SUMMARY

Effect Of Exposure To Chlorine Against Gluthatione Peroxidase (GPx) Activity, Malondialdehyde (MDA) Concentration, And Respiratory Disorders Of Swimming Pool Worker In Surabaya

Chlorine is a chemical that commonly used as a disinfectant. Chlorine can be released into the ambient and can be inhaled by workers who work in the swimming pool area. When chlorine into the respiratory tract, it can cause irritation to the cells in its path. The body's defense mechanism of the body is activating neutrophils to fagosit chlorine. The result of fagositosis is an endogenous antioxidant commonly known as Reactive Oxygen Species (ROS). In addition, the body also has antioxidant defenses by activating enzymes that one GPx to suppress the production of ROS. When the enzyme GPx was not able to keep up the production of ROS, then there is the oxidative stress in the respiratory tract cells. MDA released after oxidative stress is a sign of cell lipid oxidation. The growing production of MDA, resulting in workers complained of respiratory disorders.

The purposes of this research is to analyze the effect of exposure to chlorine against Gluthatione Peroxidase (GPx), Malonildialdehyde (MDA), and respiratory disorders of swimming pool workers in Surabaya.

The method of this research was analytical observation with cross sectional study. The location of research at KONI swimming pool, Kenpark swimming pool, and Pasar Atom swimming pool. The research was conducted from February to June 2015 The population of this research was 2 population that were the operator of disinfection and the administration worker of swimming pool in Surabaya with some criteria that male, age between 18 to 60 years old, not getting sickness for 2 weeks, and willing to participate in this study. Sample size had 24 persons that was taken by simple random sampling, 12 persons from each operator and administration worker. Methyl Orange was used to obtain chlorine level in air. ELISA technique was used to obtain GPx activity and TBARS to obtain MDA concentration. Data collection of respiratory disorders was gained by interview using a questionnaire, likewise to obtain the age data, antioxidant consumption, smoking habits, and BMI. Data analysis used linear and logistic regression.

The results of this research showed that 45,83% of respondents were 20-30 years old. Antioxidant consumption habits of respondents was 50% had three times a week. Smoking habits of respondents was 62,5% had moderate smokers. The BMI of respondents was 58,3% had normal criteria (18,5-22,9). The average level of chlorine were 0,0084 ppm in disinfection operator place and no detection chlorine level in administration workers work place. The average of GPx activity were 6,57 µ/ml of disinfection operator and 4,07 µ/ml of administration workers. The average of MDA concentration were 7,42 nmol/ ml of disinfection operator and 4,47 nmol/ ml of

administration workers. And the most of disinfection operator was respiratory disorders. The analysis results shown that GPx activity were effected by chlorine level in air (p= 0,042) and smoking habits (p=0,013) using linear regression. MDA concentration were effected by chlorine level in air (p=0,000) and age (p=0,049) using linear regression. Respiratory disorders was effected by chlorine level in air (p=0,039) using logistic regression.

The conclusion of this research was exposure of chlorine effect of GPx activity and MDA concentration swimming pool workers. Moreover, chlorine level in air were affected respiratory disorders.

The suggestions of this research is swimming pool manager must be monitor chlorine levels in air and water periodically on swimming pool to determine workers intoxication. And to swimming pool workers should notice to wind direction when disinfection process to prevent respiratory disorders.