

ABSTRACT

Cancer is a serious problem in many parts of the world, head and neck cancer ranks 6th cancer in humans. About 95% of oral cancer is squamous cell carcinoma, is currently widely attacked in the age group under 40 years. Smoking is a risk factor because in cigarettes contained chemicals that are carcinogenic, ie benzopyrene that trigger DNA mutation, that body responded to repair by GADD45 and Hsp70, or through apoptosis by wild p53, Bax and Bcl-2. Physical exercise has been shown to have positive effect on the body's systems, but there has been no study on the use of exercise to decrease of risk of oral squamous cell carcinoma at an early stage. The purpose of this study is explained the mechanism of inhibition transform cells forming of oral squamous cell epithelial due to swimming exercise of moderate intensity. Methods were : animals mice, *Mus musculus* strain Swiss Webster, male, age 2 months, BW 25-35 g, a total of 18 were divided into 3 groups. K1: mice brought into contact with water (gup), within 70% maximal swimming ability (MSA), 3 times a week for 12 weeks; at week 5th, 0.04 ml of oleum olivarium induced on the upper right buccal mucosa, 3 times a week for 4 weeks. K2 : same with K1, at week 5th, induced by benzopyrene 0.08 mg/0.04 ml oleum olivarium. K3: mice was given a moderate intensity of swimming exercise with load 3% of BW, within 70% MSA, 3 times a week, for 12 weeks; at week 5th, same with K2. On the first day of week 13th, mice anesthetized with ether, cutted the tumor tissue to the examination of expression GADD45, Hsp70, wild p53, p53 mutant, Bax , Bcl-2, with IHC methods; also counted the number of transform cells by HPA examination. Then the mice were sacrificed. Result : There were no difference among the three groups on GADD45 ($p = 0.611$) and Hsp70 ($p = 0.874$). There were significant differences among the three groups on wild p53 ($p = 0.000$), p53 mutant ($p = 0.000$), Bax ($p = 0.000$), Bcl-2 ($p = 0.000$), and transform cells ($p = 0.000$). The conclusion of this study was the mechanism of inhibition transform cell forming of oral squamous cell epithelial due to swimming exercise of moderate intensity was through inhibition of wild p53 decreased, inhibition of p53 mutant increased, increased of Bax and decreased of Bcl-2.

Keywords : swimming exercise, benzopyrene, GADD45, Hsp70, wild p53, p53 mutant, Bax, Bcl-2, transform cell.