

The study of trace elements in the hair of patients with esophageal carcinoma in highrisk area

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Abstract

AIM: To study the change of trace elements in the hair of patients with esophageal carcinoma and the role of trace elements in its development and progress.

METHODS: The hair of 60 normal people and 126 patients was collected and was divided into groups according to the patients' pathologic changes. The atomic absorption method and fluorescence method were used to measure the trace elements of copper, zinc,

iron, calcium and selenium.

RESULTS: Zinc in the hair of various patients: a remarkable difference was found between normal people ($182 \text{ mg}\cdot\text{kg}^{-1}$) and the patients ($103\text{-}81.6 \text{ mg}\cdot\text{kg}^{-1}$) ($t = 3.79, P < 0.01$ Duncan' new multiple range method). There was a certain difference between simple hyperplasia and cancer ($t = 3.21, P < 0.01$). As for copper, a great difference existed between normal people ($12.01 \text{ mg}\cdot\text{kg}^{-1}$) and patients with dysphagia ($15.16 \text{ mg}\cdot\text{kg}^{-1}$) and cancer ($17.02\text{-}17.15 \text{ mg}\cdot\text{kg}^{-1}$) ($t = 2.43, P < 0.05$). No change of zinc and copper was observed in cancer patients ($t = 1.61, P > 0.05$). The ratio of zinc to copper increased with the development of pathologic change. The selenium levels in patients ($0.46\text{-}0.67 \text{ mg}\cdot\text{kg}^{-1}$) was below that of normal people ($1.03 \text{ mg}\cdot\text{kg}^{-1}$), while iron and calcium levels in the patients decreased with the development of pathologic process.

CONCLUSION: Both zinc and copper play an important role in the pathologic change of esophageal carcinoma. Zinc and copper in the hair changed with development of the pathologic process. Zinc revealed positive correlation ($r = 0.889, P < 0.01$) while copper showed negative correlation ($r = 0.921, P < 0.01$). The ratio of copper to zinc in the hair is of great diagnostic value.

Key words: Esophageal neoplasm/etiology; Trace elements; Zinc; copper; Selenium

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