SOME BIOLOGICAL IMPORTANT TRACE ELEMENTS CONCENTRATION IN HAIR SAMPLES OF ÇILDİREN AT LOW SOCİOECONOMİC INCOME LEVEL SCHOOLS

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About 25 elements are recognised as essential for human life. Of these, 11 (including Cu, Mn, Cr, Fe, and Mg) are present in trace amounts. Although they are minor building components in tissues, trace elements directly or indirectly play an important role in various human physiological and metabolic processes. Most of them are part of metalloenzymes and participate in biological function, such as oxygen transport, free radical scavenging, structural organization of macromolecules, and hormonal activity [1]. For example, Fe plays a vital role in the regulation of cell growth and is an essential part of many proteins and enzymes. Cu is found in all living cells and is essential for a wide range of biochemical processes [2]. Although the exact mechanism of action of chromium compounds on tissues is not extensively studied, it is observed that Cr can generate reactive oxygen species during its reduction in successive oxidation states [3]. For these reasons, in the last few decades the analytical study of concentrations trace elements in biological and human samples has become very important. The analysis of human hair is useful in monitoring the levels of certain trace elements in the body. Hair samples can be stored at room temperature for a long time, and their composition does not change measurably [4].

Elements of interest in this study are Cu, Mg, Cr, Fe, and Mn in hair. The samples were taken from the occipital area of the head, close to the scalp with stainless-steel scissors and washed (with acetone, water and acetone) and then samples were dried in a drying oven at 100 °C before analysis. Hair samples of about 50 mg were weighed and they were digested with 9 mL of 68% ultra pure nitric acid and 1 mL of 35% hydrogen peroxide using a microwave digester. Completely clear, colorless, homogenous digests were obtained, and subsequently diluted with high-purity water to 25 mL. The diluted solutions were supplied to the determination of trace elements level by ICP-MS. The average range of concentrations for trace elements in hair samples were found (µg/g): Cu: 0.03- 5.2; Mg: 0.02- 44.6; Cr: 0.42-18.4; Fe: 0.003- 897; and Mn: 0.02- 0.9.

References