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Hair and Nails Levels of Iron of Some Healthy Volunteer Women from Saudi Arabia

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The levels of iron in hair and nails of some healthy volunteer women from Saudi Arabia were determined. The level of iron were found to be lower than that reported from different places in the world. Hair and nails are useful parameters for measurement of the accumulation of metals in the human body.

Key words: Hair, nails, iron, healthy women, Saudi Arabia

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Introduction

Living system have enveloped mechanisms for obtaining essential metals from the environment and, of no less importance, ways to protect themselves from potential harm brought on by excess, thus, essential metals can only be toxic because of level, not presence (Harris, 1991). The major interest in iron is as an unessential metal needed by all cells in small amount, but toxicological considerations are important in terms of accidental acute exposures and chronic iron overload due to idiiopathic hemochromatosis or as a consequence of excess dietary iron or frequent blood transfusion (Jacobs and Worwood, 1981). Blood, urine, hair and nails are the most accessible tissues in which to measure dose and are sometimes referred to as indicator tissues, blood and urine reflect recent exposure and correlate best with acute effects, hair and nails can be useful in assessing variations in exposure to metal over the long term (Goyer, 1982). Biological monitoring of iron adequacy is a problem faced by clinicians and experimental nutrition's, for example low blood iron or anemia, may only suggest iron intake is in adequate, also anemia a primary symptoms of low dietary iron, can also arise if iron metabolism is impaired (Dallham, 1982). System tolerate to iron is generally quite strong in animals, intake not exceeding 100 mg/day are generally regarded as safe (Finch *et al*., 1972).

The most quoted example of extraordinary tolerance of human to iron overload is the malnourished Bantu tribesman in South Africa who have developed a disorder called Bantu siderosis, which estimates of 200 mg of iron per day are consumed (MacDonald *et al*., 1963).

Correlation between blood levels of metal and concentration in hair and nail is not expected because blood levels reflects only current exposure (Sen and Chaudhri, 1996). The total iron content of the human body varies with age, sex, nutrition, and state of health (Wells and Awad, 1992). The objective of the study, to determine the level of iron in the hair and nails of healthy volunteer female from Saudi Arabia.

Materials and Methods

Hair and nails samples were collected from healthy volunteer women from Riyadh city, Saudi Arabia, and were washed immediately with alcohol then rinsed with dionized water and stored. Samples of hair and nails 0.5g were added separately to 10 ml conc. nitric acid and heated moderately under refluxing for complete digestion. dilute nitric acid was used for dissolution of the ash obtained by wet decomposition and the volumes were completed to 100 ml deionized water, the undissolved residue was removed and supernatants were stored refrigerated in plastic test tubes. Iron standard were prepared by dissolving 1g of iron metal in 20 ml of 5M hydrochloric acid and diluted to liter with deionized water. Working standard were freshly prepared daily, by dilution of standard solution to final conc. of 50 ppb and 25 ppb solution for two standard calibration points. Standard and samples were measured on electrothermal atomization atomic absorption spectrophotometer, Pye Unicum SP9 equiped with graphic Furnace and Video Computer Programmer. Instrument background corrections were carried in the setting procedure by using deionized water acidified with nitric acid in the ratio of 1:4.

Results and Discussion

The data indicated that the volunteer women have different levels of iron in their hair and nails (Table 1), the 9 months infant girl has the higher amount of iron in her nails than the other subjects, while the 38 years old lady has the same levels of iron in her hair and nails, small level of iron found in the hair of 9 months infant girl. Domestic and international comparison of the data from human present difficulties since, there is considerable division in the levels of these metals in population. Little attention have been paid to the metal analysis in blood, urine, hair, and nails from Saudi Arabia. Hashem and Al-Nasser (2000) reported that the conc. of iron in hair and nails from different workers volunteer male from Riyadh city, Saudi Arabia ranged between 12 to 67 ug/g respectively. The data were lower

Table 1: Iron level (μg/g) in hair and nails of different volunteer female (n = 5, ± standard deviation).

	Level (μg/g)	
Age	Hair	Nails
9 Months	0.95 ± 0.11	42.85 ± 1.93
19 Years*	2,31 ± 0.31	16.21 ± 0.51
27 Years*	5.00 ± 0,93	25.67 ± 0.61
35 Years*	3.15 ± 0.58	11,48 ± 0.32
38 Years**	18.64 ± 1.01	18.91 ± 0.85

*Not Married ** Married

than that reported earlier from different places in the world (Weber *et al*., 1990). The iron deficiency is the most frequently encountered, clinically manifest deficiency diseases in main, in adult men and postmenopausal women the principle cause is chronic blood loss due to infections malignancybleeding ulcers, and hookworm infestation, iron deficiency anemia is much more common in women than in men because women of fertile age are subject to additional iron loss in menstruation, pregnancy, and lactation (Underwood, 1971). The hair of the infant contain the higher amount of iron than the other donors, this may be reflect that the greater need for iron supplementation during early infancy (McCane and Widdowson, 1951). Hair and nails can be ideal indicators of metal toxicity to the human body and to Saudi Arabian environment.

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