Very high prevalence of zinc deficiency in elderly hospitalized patients in Ahvaz, Iran

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Approximately 33% of elderly people in the world are at risk of zinc deficiency.[1] Reports from different countries have shown prevalence of zinc deficiency among old people.[2-4] Diet surveys indicate that zinc intake in the elderly are often inadequate. Several factors may contribute to poor zinc nutrition among the elderly. These include reduction in food intake due to reduced mobility or depression, and poor access to zinc-rich foods. In addition, there is evidence that the efficiency of zinc absorption may decrease with age. This deficiency can lead to DNA damage, wasting of body tissues, loss of eyesight, acute infections, oral periodontal diseases, muscular and bone performance abnormalities, neurological complications, and loss of memory. Several medical illnesses and disabilities are shown frequently among old people. In addition, advancing age is often accompanied by loss of key social support systems. Therefore, old people are more prone to diseases than other adults.

Zinc inadequacy in elderly people may lead to serious complications.[5] Although Iran is the country where the first document on human zinc deficiency was reported from, now we report the magnitude of such deficiency among elderly hospitalized people. This study was carried out in order to determine the prevalence of zinc deficiency among elderly patients hospitalized in Golestan Hospital, the largest hospital in Ahvaz, located in the south-west of Iran. The study was carried out on elderly patients (age >60 years) in different wards of Golestan Hospital, Ahvaz, Iran from September to October 2007. There was a total of 120 old subjects who were referred to the hospital. Thirty-two subjects who suffered from infections, hepato-splenomegalia, dwarfism, renal failure, diarrhea, anorexia, and pneumonia, or digestion tract abnormalities were excluded. The final selected subjects were 88 (47 females and 41 males). The age

range of men was 63-89, and 61-84 years for women. The mean age of females was 70, and 68 years for males. Blood samples were collected from the subjects, and the serum of the samples were obtained and refrigerated at -20°C until biochemical analysis. Serum zinc levels were measured by colorimetric method using Randox kit (Randox Laboratories, Crumlin, United Kingdom). Serum zinc levels lower than 70 µg/dL in females, and lower than 72.6 µg/dL in males were defined as zinc deficiency. Chi square and Student t-tests were used for statistical analyses. The study protocol was approved by the ethics committee of the Ahvaz Jundi Shapour University of Medical Sciences.

The results obtained are presented in **Table 1**. Zinc deficiency was found in 60% of all subjects. Serum zinc concentration was significantly lower in women compared with men (p=0.007). The presented results in **Table 1** clearly shows that zinc deficiency in female subjects (74%) is more prevalent than male subjects (44%), and the difference between these 2 groups was statistically significant (p=0.009). This cross sectional study revealed a very high prevalence of zinc deficiency (60%) among elderly patients in Golestan Hospital in Ahvaz, Iran. Pepersack et al[2] reported 28% zinc deficiency in 50 hospitalized elder patients in Bruxelle, Belgium. de Jong et al[3] assessed 103 elderly females in New Zealand and reported 12% hypozincemia. Sfar et al[4] reported 35% zinc deficiency in 100 healthy Tunisian elder persons. In our study, serum zinc levels were much lower than all similar surveys. It may be the result of zinc deficiency in agricultural soils of the region, as there are some studies[6] that have demonstrated this problem. In our study, zinc deficiency in females was significantly higher than males. There was no consistent evidence regarding the difference of zinc deficiency prevalence between men and women.

In summary, zinc deficiency among elderly hospitalized patients in Ahvaz may be a serious problem, which may be due to zinc intakes below the recommended dietary allowance (RDA), or lifestyle

Table 1 - Serum zinc concentrations and zinc deficiency in elderly hospitalized patients.

Gender	n	Mean ± SD serum zin µg/dL	Normal n (%)	Zinc deficient n (%)
Females*	47	62.7 ± 24.2	12 (26.0)	35 (74.0)
Males	41	79.2 ± 17.7	23 (56.0)	18 (44.0)
Total	**88**	**70.3 ± 22.9**	**35 (40.0)**	**53 (60.0)**

SD - standard deviation,*difference between males and females was statistically significant as tested by Student t-test (p=0.007), Chi square test (p=0.009)

habits. Therefore, zinc supplementation might promote (at least in many cases) zinc status in such patients. Most cases with zinc deficiency can be corrected with supplemental zinc. However, it should be noticed that excess intake of zinc in supplements can interact with copper absorption. Findings of this study should be considered with caution, due to the small sample size and recruiting subjects from only one hospital, but if further studies confirm such high prevalence of zinc deficiency among this age group, then prescribing zinc supplement in elderly hospitalized people should be considered more seriously.

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