Current Bone Mass and Body Weight Changes in Alcoholic Males

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Summary. The relationships between current bone mass and changes in body weight were studied in 45 male veterans whose weights and heights at the time of enlistment into the Armed Forces over 40 years ago were obtained, and who were, or had been, chronic alcohol abusers. Those who lost and those who gained weight did not appear to differ in severity of alcoholism but differed in femoral neck cortical thickness, iliac crest trabecular bone volume, and lumbar bone mineral density, the former being significantly lower. Subjects with a hip fracture and those with spinal fractures are significantly lighter now, but were initially of similar weight to those without fractures. We conclude that maintenance of body weight protects against bone loss and fracture even in the presence of chronic alcoholism.

Key words: Alcoholism — Metabolic bone disease — Male osteoporosis — Hip fracture — Weight loss — Bone mass.

Many reports have noted a significant relationship between bone mass and body weight [1–6]. The relationship varies from site to site [4] being particularly good for the os calcis [7]. In some diagnostic categories such as hip fracture, low body weight appears to be a risk factor [8, 9]. Bone loss occurs as a consequence of weight loss from dieting in obesity [10], but little is known about the effect of changes in body weight throughout life on bone mass. For example, it is not known if the lighter elderly females with a hip fracture were always light or have lost weight, and bone, over a period of years. A recent report demonstrated the positive benefit of weight in preserving bone following the menopause [6], suggesting that light females will lose bone after the menopause, thereby becoming a fracture-prone group in older life.

In a recent study [11], we found a significant correlation between bone mass and weight in alcoholic males, and a tendency for those with a hip or spine fracture to be lighter. Those with and those without fracture did not differ significantly in any other manner except hydroxyproline excretion and had similar histories of alcohol abuse. These findings suggested that light body weight in males acted to increase bone loss when the subject was exposed to a specific risk factor such as alcohol excess, in the same way that lower body weight predisposes females to postmenopausal bone loss. We were also interested in knowing if the osteoporotic subjects had always been lighter or if they had lost weight through their adult life, perhaps as a result of their life-style. All these men had weights and heights recorded when they entered the Armed Forces as young men and we have been able to compare these with their current measurements.

Subjects and Methods

Fifty alcoholic males, all alcoholic as defined by Victor and Adams [13], were studied and have been the subject of previous reports [11, 12]. Smoking and health histories were obtained, along with age, height, and weight. All veterans gave permission for these data, obtained at time of enlistment in the Services, to be supplied to us by the Department of Veterans’ Affairs, Canada. This information was obtained for 45 subjects. We have no knowledge of the methods used for measurement or their accuracy. For many individuals, there were several recordings as they left and re-entered the Service on different occasions. Where available, we took a weight and height while they were in their early 20s, assuming that men in their 'teens may not have reached their mature weight. However, 1 patient was 18 years old, 3 were 19, 9 were in their early 30s, and 1 was 42. Overall
Results

Figure 1 compares the bone mass of subjects who have lost weight over the years with those who have gained. Their initial weights were very similar [65.2 ± 1.6 (SE) kg vs. 64.1 ± 1.3 (SE) kg, respectively] but now, of course, differ significantly [57.1 ± 1.3 (SE) kg vs. 73.1 ± 1.8 (SE) kg]. The current bone mass measurements in the two groups are also significantly different for all measurements except CA/TA and forearm density; these are the two parameters that show no correlation with current body weight (Table 1).

Twenty-three of the 45 subjects had spinal osteoporosis; this includes all those (N = 11) who had