



## FRACTURES AND LIFESTYLE: EFFECT OF CIGARETTE SMOKING, ALCOHOL INTAKE, AND RELATIVE WEIGHT ON THE RISK OF HIP AND FOREARM FRACTURES IN MIDDLE-AGED MEN.

### Orthopaedics

<b>Dr. R Venkat Praveen</b>	Post Graduate, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Biher, No. 7, Works Road, New Colony, Chromepet, Chennai - 600044, Tamilnadu, India.
<b>Dr. Sanjay</b>	Post Graduate, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Biher, No. 7, Works Road, New Colony, Chromepet, Chennai - 600044, Tamilnadu, India.
<b>Dr Vijainarasimman Reddy*</b>	Professor and Head, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Biher, No. 7, Works Road, New Colony, Chromepet, Chennai - 600044, Tamilnadu, India. *Corresponding Author

### ABSTRACT

Cigarette smoking, alcohol consumption and low relative weight are cited as risk factors for Osteoporosis. In a prospective cohort study of 80,000 middle aged men (35-59), alcohol consumption of more than 20 grams/day and relative weight of less than 25 kg/m<sup>2</sup> together was found to be a risk factor for forearm and hip fractures while smoking did not affect it.

### KEYWORDS

#### INTRODUCTION

In a prospective cohort study of middle-aged men, we estimated the effect of cigarettes, alcohol, and obesity on the risk of fractures of the hip and forearm. Osteoporosis has been associated with lifestyle variables such as cigarette smoking,<sup>1-4</sup> high alcohol consumption<sup>4-6</sup> and relative weight.<sup>1,4,7</sup> A Retrospective Cohort study<sup>11</sup> and Case-Control studies<sup>8-10,12</sup> have shown that men who are thin are more likely to suffer from hip and forearm fractures than their well-built and obese counterparts which showed the association between fractures and relative weight.

#### Methods

In 2008, 1,10,200 males aged 30 to 60, living in India, completed a survey on suspected risk factors for cancer<sup>13</sup> and coronary heart disease.<sup>14</sup> Every two years, the survey was continued and the males with cancer were excluded and the ones who sustained a fracture were followed up. Information was collected on age, height, alcohol consumption and smoking in the 2014 survey. In 2016 and 2018, the men were asked if they sustained any forearm or hip fracture in the preceding two years and were considered cases if yes. To assess the report, random samples of men of their relevant medical records were asked and tested. Cumulative incidence rates were determined for fractures occurring during the four years of follow-up (2014-18). As a measure of association, relative risk was also calculated. Using the 2008 questionnaire, the men were divided into 5 roughly equal sizes:

- ages 35-39 (22 per cent of the men)
- 40-44 (20 per cent)
- 45-49 (21 per cent)
- 50-54 (20 per cent)
- 55-60 (17 per cent)

#### Respondents were categorised into 5 groups:

- Never smoked (44 per cent)
- Ex-smoker (27 per cent)
- One to 14 cigarettes per day (8 per cent)
- 15 to 24 cigarettes (12 per cent)
- More than 25 (8 per cent).

Next, the consumption of alcohol per day was evaluated. Respondents were asked about the use of beer, wine, whiskey, gin, etc.,. They were instructed to select one of follows:

- 6+ per day
- 4-6 per day
- 2-3 per day
- 1 per day
- 5-6 per week
- 2-4 per week
- 1 per week
- 1-3 per month
- Almost never

#### The alcohol in each was:

- 13.2 grams – beer
- 10.8 grams – wine
- 15.1 grams - liquor.

Total alcohol intake = Beer + wine + liquor (each individual).

#### According to alcohol intake per day, the men were divided into 5 groups:

- 0 (30 per cent)
- 0 and 1.4 grams/day (12 per cent)
- 1.5 to 4.9 grams/day (20 per cent)
- 5 to 15 grams (19 per cent)
- More than 15 grams (13 per cent)

The alcohol intake was correlated with the four one = diet periods and were reproducible within a year.

Later, Relative weight was calculated as weight in kilograms divided by height in meters squared (Quetelet's index) and was divided as follows:

- less than 21 kg/M<sup>2</sup> (21 per cent)
- 21 to 23 (24 per cent)
- 23 to 25 (20 per cent)
- 25 to 29 (20 per cent)
- More than 29 (14 per cent)

A relative weight of under 25 kg/M<sup>2</sup> corresponds to a 5'4" man weighing less than 53.5 kgs.

#### RESULTS

Only under 1% of the men reported a fracture of hip or forearm between the period of 2014-2018.

There was good correlation between fractures and increasing age of men, mainly in the age group of 55-60.

There was also a small link between fractures and alcohol consumption. Men who consumed more than 20 grams per day were more at risk for fractures than the others. The relative risk was found to be 1.24.

But, fractures and smoking were independent of each other. Smoking did not cause any risks leading to fractures.

And compared to those of higher relative weights, the thinnest men (<25 kg/M<sup>2</sup>) were at increased risk for fracture.

Men who drank more than 20 grams per day and found to be thin were at a higher risk of fracture than men who were thin and had less than 20grams of alcohol per day.

The low weight men who drank most heavily had an age-adjusted risk of fracture. (relative risk = 1.73).

In terms of absolute risk, there was found to be no interaction between relative weight, cigarette smoking, and risk of fractures in this population.

## DISCUSSION

A recent consensus conference argued for "observational and epidemiologic studies to determine the impact of multiple and behavioural factors on fracture frequency.<sup>15</sup> In agreement to that recommendation, we examined the relationship between the risk of hip and forearm fracture and their correlation between: cigarette smoking, alcohol consumption, and relative weight. The study was large-prospective data. Nevertheless, the data comprised of information from men less than the age of 60, so generalization was affected.

We observed a marked increase in fracture rates with age.

The other finding was that cigarette smoking was not a risk factor for fractures. It is possible that smoking increases the risk of osteoporosis," but did not alter the risk of fracture among these middle aged men because they were too young. With further increase in age, the study would've been more vast.

Alcohol intake is a risk factor for most injuries, including falls which accounts for most fractures.<sup>16,17</sup>

Alcohol consumption may also have the long-term effect of reducing bone density.<sup>4-6</sup> So, the lesser the bone density, more the number of fractures.

We observed no differences in the risk of fracture between teetotalers and those consuming less than 20 grams of alcohol per day.

Therefore, alcoholism has been cited as a substantial risk factor for fractures.

Relative weight may be associated with fractures for reasons like, for example, Heavier men, may have a large bone and have more bone mass to lose before the process of osteoporosis. Additionally the fat itself may offer cushioning protection during a fall.

We also found that the thin men are at somewhat higher risk for fracture. Thinness and heavy alcoholism together had a relatively larger risk (particularly among men over 50 years old) and needs further research. While this study has the advantage of being large and prospective, it suffers from several limitations. It includes few elderly men, who are at greatest risk for fracture and subsequent mortality. And the survey included both forearm and hip fractures together even though they had different etiologies.

### In this study we examine only four independent variables:

- Age
- Cigarette smoking
- Alcohol consumption
- Relative weight

Nonetheless, this conclusion explains very little about the effects caused by the three factors.

Even other men, thin or fat, smoking or non-smoking, teetotalers or alcoholics -generally had an equal chance of sustaining a hip or forearm fracture. The evidence suggests that otherwise beneficial habits such as avoidance of smoking and obesity may not significantly reduce the risk of fracture among middle-aged men.

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