A study of factors leading to osteo-penia in the community: BMD camp based approach

Santosh Kumar Mishra¹, Anshuli Trivedi²*, Anubhooti Trivedi³

¹Dept of Orthopaedics, Gandhi Medical College Hamidia Hospital, Barkatullah Univeristy, Bhopal, M.P., India
²Dept of Community Medicine, Gandhi Medical College, Hamidia Hospital Barkatullah Univeristy, M.P., India
³Medical Officer Saket Nursing Home, Jabalpur, M.P., India

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*Correspondence:
Dr. Anshuli Trivedi,
E-mail: dranshulitrivedi@yahoo.com

ABSTRACT

Background: Osteoporosis is an important public health problem in times of increasing life expectancy. A large number of cases are undiagnosed resulting in bone fragility & fractures. Bone mineral density reduces physiological in both sexes, but it is more rampant in women in hypoandrogenic states, i.e. post menopause.

Methods: A community based bone mineral density estimation camp was organized in a private health facility catering to the urban community in Jabalpur district of M.P during February 2015. In the camp bone mass density of attendees was assessed using DEXA technique & WHO criteria based on T score were used in the study to assess the bone mineral density. Information about social-demographic condition along with brief medical & surgical history was elicited. The results were presented in terms of percentage & proportions. The tests of significance were used for establishing associations between variables.

Results: In total 298 persons attended the camp. There is a statistically significant association between prevalence of decreased BMD with age (p<0.001). In total, 55.74 % female attendees had T-score < -1.0. Hysterectomised women had statistically significant lower mineral densities. There is a significant association between regular alcohol intake & decreased BMD as all the Osteoporotic men in the study had BMD < -2.5.

Conclusion: A camp based approach helps in identifying subclinical cases of Osteopenia in the community.

Keywords: Osteoporosis, Camp based approach, DEXA technique, T-score

INTRODUCTION

In today’s times of increasing life expectancy there is an increase in prevalence of degenerative conditions like osteoporosis. Osteoporosis is a progressive bone disease that is characterized by a decrease in bone mass and density which can lead to an increased risk of fracture.¹ In osteoporosis, the bone mineral density (BMD) is reduced, bone micro-architecture deteriorates, and the amount and variety of proteins in bone are altered. Osteoporosis is defined by WHO as a bone mineral density of < 2.5 SDDEV or more below the mean peak bone mass.² In times of increased women empowerment where women are becoming bread earners, they are at par with men. There is a serious need to focus on their health. In Indian scenario women being involved in family life usually ignore their health resulting in decreased in bone densities. Also, as hormonal factors strongly influence the pace of bone resorption; lack of estrogen (e.g. As a result of menopause) increases bone resorption, as well as decreases the deposition of new bone that normally takes place in weight-bearing bones.³ Women are exposed to hypo-androgenic states following physiological menopause or early menopause following hysterectomy for some gynecological reasons. Females suffer from Type-1 or post menopausal osteoporosis, whereas type 2 or senile osteoporosis is common in both sexes after 75 years of age.⁴ As it is established that bone density decreases with age, more people become osteoporotic with increasing age.⁵
Osteoporosis is seldom diagnosed as it is usually symptomless. But its main consequence is the increased risk of bone fractures. There is increased bone fragility & fractures occurring in conditions where healthy people would not normally suffer a fracture. Typical fragility fractures occur in the vertebral column, rib, hip and wrist. Bone mineral density is diagnosed using Dual-energy X-ray absorptiometry (DXA) in which bone mineral density level is less than or equal to 2.5 standard deviations below that of a young (30–40 year old), healthy adult women reference population. This is translated as a T-score. The study aims to understand social, demographic profile of attendees to assess awareness about the importance of BMD estimation for early diagnosis & treatment of Osteopenia/orosis. It also aims to find correlates of various factors responsible for the decrease in BMD. A camp based approach is free of cost means of providing medical services to the community at their doorstep & ensure their greater participation.

METHODS

A community based bone mineral density estimation camp was organized in a private health facility catering to the urban community in Jabalpur district of M.P during February 2015. In the camp bone mass density of attendees was assessed using DEXA technique in which thickness of the styloid process of the radius was measured. The WHO criteria based on T-score was used to study in which Normal Bone mineral density BMD T-score was ≥ −1.0. Osteopenia is −2.5 < T-score < −1.0, Osteoporosis is T-score ≤ −2.5 & severe osteoporosis is a T-score ≤ −2.5 with fragility fracture. The patient’s socio demographic profile was recorded along with history of any chronic medical conditions or hypo-androgenic states were recorded using predesigned pretested proforma. Those consenting for inclusion in the study were interviewed & their data was compiled & analyzed by using MS-Excel-2007. The results were presented in terms of percentage & proportions. The tests of significance were used for establishing associations between variables. The patients having T-score < −1.0 were given nutritional advice, calcium supplements & were counseled for regular BMD assessment.

RESULTS

In total 298 persons attended the camp. Amongst attendees 39.59 % attendees were osteopenic/orotic. Of all attendees 36.91 % were of 30-45 years of age more than half were female attendees (Table 1). In total 38.09 % patients > 75 years had T-score ≤ −2.5 (Osteoporosis). There is a statistically significant association between prevalence of decreased BMD with age (p<0.001) (Table 2). In total 51.34 % attendees were females out of which 41.17 % had score −2.5 < T-score < −1.0 (Osteopenia) & 14.37 % had T-score < −2.5 respectively (Table 1). In total 7 female attendees were hysterecomised out which 57.14 % had T-score < −2.5. In general females had lower BMD (p<0.001) & hysterecomised women had statistically significant lower mineral densities than women who retained uterus (Table 2). In total 62.42 % attendees were below poverty Line (BPL) & 61.07 % attendees were illiterate or informally educated (Table 1). In the study 19 male attendees were regular alcoholics & consumed atleast 40 gm of alcohol daily for at least past 3 years. There is a significant association between regular alcohol intake & decreased BMD as all the Osteoporotic men in the study had BMD < −2.5 (Table 1).

Table 1: Demographic characteristics.

| Distribution of attendees on the basis of age | N   | %   |
|---------------------------------------------|-----|-----|
| <30                                         | 55  | 18.46 |
| 30-45                                       | 110 | 36.91 |
| 46-60                                       | 67  | 22.48 |
| 61-75                                       | 45  | 15.10 |
| >75                                         | 21  | 7.05 |
| Total                                       | 298 | 100.00 |

| Distribution of attendees on the basis of sex |   |   |
|---------------------------------------------|---|---|
| Male                                        | 145 | 48.66 |
| Female                                      | 153 | 51.34 |

| Distribution of attendees on the basis of socio economic classification |   |   |
|-------------------------------------------------------------------------|---|---|
| Below Poverty line                                                      | 186 | 62.42 |
| Above Poverty line                                                      | 112 | 37.58 |

| Distribution of attendees on the basis of education |   |   |
|-----------------------------------------------------|---|---|
| Illiterate                                           | 89  | 29.87 |
| Formal education                                     | 93  | 31.21 |
| Upto class V                                         | 44  | 14.77 |
| V-VIII Class                                        | 39  | 13.09 |
| VIII-XII Class                                      | 18  | 6.04 |
| Graduate & Post graduate                            | 15  | 5.03 |

Table 2: Bone mineral density.

| Distribution of patients on the basis of T-score & Age |   |   |
|------------------------------------------------------|---|---|
| <30                                                  | 46 | 9  | 0.00 | 55 |
| 30-45                                                | 85 | 24 | 1.00 | 110|
| 46-60                                                | 35 | 30 | 2    | 67 |
| 61-75                                                | 10 | 22 | 13   | 45 |
| >75                                                  | 4  | 9  | 8    | 21 |
| Total                                                | 180| 94 | 24   | 298|

| Chi sq-105.15 df-8 p<0.0001                          |   |   |
|------------------------------------------------------|---|---|
| Distribution of patients on the basis of sex & T-score | | |
| Males                                                | 112| 31 | 2    | 145|
| Females                                              | 68 | 63 | 22   | 153|

| Chi sq-38.13 df-2 p<0.0001                            |   |   |
|------------------------------------------------------|---|---|
| Distribution of females on the basis of androgenic states | | |
| Uterus present                                       | 99 | 45 | 2    | 146|
CONCLUSION

A camp based approach helps in identifying subclinical cases of Osteopenia in community. They can help in increasing awareness of skeletal health especially in developing countries where a large section of population cannot afford expensive investigation like BMD estimation. A community camp based approach has greater participation of women as their health is usually neglected in times of increased out of pocket expenditure on health.

Limitations

As it was a camp based study other investigations to confirm medical conditions could not be performed.

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