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Racial comparisons of postmenopausal Osteoporosis between African American and Caucasian women

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Abstract

Background: Osteoporosis is a chronic degenerative metabolic disease of the skeletal system characterized by decreased bone mineral density (BMD), leading to fragile bones prone to fractures. Postmenopausal osteoporosis is particularly prevalent due to the decline in estrogen levels, a hormone essential for maintaining bone health. This study aims to compare the incidence and risk factors of postmenopausal osteoporosis between African American and Caucasian women, focusing on differences in BMD, risk factors, and the effectiveness of screening and treatment methods.

Methods and Materials: This research was conducted at the Southeastern Medical Center, Texas, involving 1,000 postmenopausal women aged 60 or older, with equal representation of 500 African American and 500 Caucasian women. Data collection included demographic information, medical history, and BMD measurements using the General Electric LUNAR DPXIQ Model 2288 DEXA device. Statistical analysis was performed using Chi-square and Fisher's assessment tests to evaluate risk factors such as alcohol intake, smoking, medication usage, and comorbidities. BMI and age evaluations were systematized, and the World Health Organization (WHO) guidelines were used to classify osteoporosis and osteopenia.

Results: The study revealed that Caucasian women had higher alcohol intake, family history of fractures, and greater use of vitamins, calcium, and hormonal treatments compared to African American women. Conversely, African American women exhibited higher rates of comorbidities like diabetes mellitus, hyperthyroidism, kidney diseases, and rheumatoid arthritis. Despite starting menopause with higher BMD levels, African American women were less likely to be prescribed medication for low BMD. Screening rates and adherence to recommended treatments also varied significantly between the two groups.

Conclusion: The findings highlight significant racial disparities in the incidence, risk factors, and management of postmenopausal osteoporosis. Increasing awareness about osteoporosis and promoting lifestyle modifications such as diet, exercise, and cessation of smoking and alcohol consumption can help mitigate these disparities. Future research should focus on developing targeted interventions to improve screening and treatment adherence among African American women, addressing the specific challenges they face in managing bone health.

Keywords: Postmenopausal Osteoporosis**,** Bone Mineral Density (BMD)**,** Racial Disparities**,** African American Women**,** Caucasian Women.

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Project Definition

The term Osteoporosis implies parous bone. It is a chronic progressive degenerative metabolic disease of the skeletal system that causes a decrease in Bone Mineral Density (BMD), making the bones brittle, fragile, and easily prone to fractures. Postmenopausal Osteoporosis develops in women after menopause mainly due to the decline in the level of a hormone called estrogen. Estrogen plays an important role in the development of a healthy musculoskeletal system. A decrease in this hormone level leads to bone problems, such as Osteoporosis or osteopenia.

Project Setting

This capstone project is focused on the world's third-largest country in size and practically the third-largest in terms of population. I will conduct my capstone project at Southeastern Medical Center Texas, The United States of America.

This project includes elderly women in their postmenopausal period aged 60 or older. Due to the country's diversity, I will select 500 African American and 500 Caucasian women. However, albeit there were a few other races of women in the primary care center, such as Hispanics and Asian American women, nonetheless, I decided to strictly work on only African American and Caucasia women as these were most of the races. The head of the clinic, the nurses, specialists, and a research assistant will be taking part in this study to provide me with all the medical data of patients participating in this project and other useful materials I might need to run a smooth and organized project.

Project Relevance and Rationale

A modest number of women, regardless of their race, lose up to 20% of their bones in the first few years of menopause, making women susceptible to the development of primary Osteoporosis. By conducting this capstone project, I intend to call the attention of this condition to the geriatric population because the level of awareness of postmenopausal Osteoporosis is sparse amongst this group of women. Many of these women are uninformed or ignorant of the condition and ways of preventing it. The reasons below are why I am adamant about carrying out this capstone project.

Firstly, Osteoporosis has a severely deleterious effect on the normal day-to-day life of women, degrading their way of life and lowering the quality of their lives. Most women at this age are widows and live alone; most of them still work to sustain a living because their monthly pension salary is not sufficient. Broadening the awareness of this condition will help them in all possible ways before the condition becomes detrimental.

Secondly, screening of postmenopausal Osteoporosis using the gold standard method DEXA will help in identifying women who have a low or high risk of developing Osteoporosis, which will reduce the chances of a bad prognosis once it is diagnosed and treated. Screening for postmenopausal Osteoporosis will also lower the chances of osteoporotic-related fractures, falls, and injuries in these women.

Thirdly, postmenopausal Osteoporosis is caused mainly due to estrogen deficiency. However, raising the awareness of a healthy diet containing vitamin D supplements, calcium and hormonal therapy, and weight-bearing exercises to prevent obesity would benefit this group of women.

Lastly, the nation as a whole would benefit the most as, on average, the cost to care for women with postmenopausal Osteoporosis in the United States of America is close to 15 billion dollars (about $46 per person in the US). Thus, enlightening these women on basic lifestyle changes to improve bone health, screening, and regular medical checkups will benefit these individuals and the nation in general.

Final Project Overview

1. To evaluate osteoporosis knowledge and level of awareness among postmenopausal women.
2. To prevent future complications of postmenopausal Osteoporosis among postmenopausal women.
3. To find out which race is more affected by postmenopausal Osteoporosis between African American women and Caucasian women.
4. To find out the racial correlation of postmenopausal osteoporosis risk factors among African American women and Caucasian women.
5. To encourage screening of postmenopausal Osteoporosis in the geriatric population.
6. To motivate and enlighten postmenopausal women on the importance of keeping a healthy body weight and a good diet.

Research Summary

1. I have accumulated all the resources and information on Osteoporosis in postmenopausal women, the risk factors, screening, and treatment.
2. The DEXA device I will use in this research is a General Electric LUNAR DPXIQ Model 2288.
3. I will use the Chi-square assessment test to compare the number of recommended DEXA screening and cohering DXA screening consultations, the number of confirmed diagnoses of Osteoporosis, and the number of medications for low BMD prescribed for management of Osteoporosis in African American and Caucasian women.
4. I will use Chi-square and Fisher's assessment tests to compare risk factors such as smoking, alcohol intake, and other medication usage, e.g., steroids. If one or the other were found, I would mark it as a positive risk factor.
5. I will use a systematization setback strategy for BMI and age evaluation.
6. To compare the result of the study, I will make a conclusion based on WHO guidelines (T-score $\leq$ -2.5 suggests Osteoporosis, and ≤ -1.0 to ≥ -2.4 predicts osteopenia).
7. I will compile and analyze feedback from the surveys to decide the next step to be taken.
8. I seek conventional consultations from my supervisors for further recommendations.

Project Implementation Summary

1. I have finalized my research with the help of the chief doctor, the nurses, specialists, and a research assistant to help guide me based on a researcher's point of view.
2. I assembled and coordinated our first formal meeting by making use of help from specialists in different departments, nurses, the local community members, and the family members of the women who participated in this study.
3. I will investigate community projects and health services that will help community members improve their lifestyle habits and broaden their awareness of postmenopausal Osteoporosis with the intention of preventing future complications of this disease.

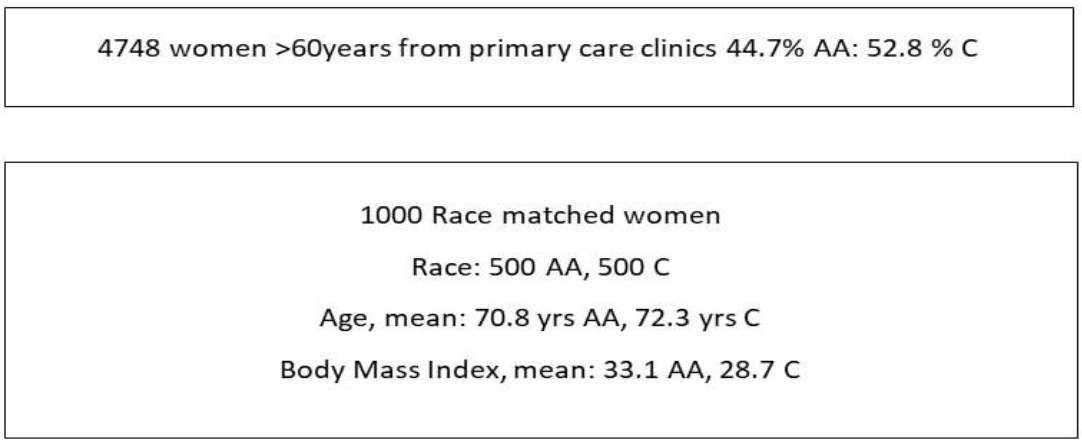
4. In drawing things to a close, I will compose an elucidated set of references, every important data and information. (listed in APA style).

Project Timetable

Week 1: Discovering and deciding on the project topic, project definition, scope, and rationale.
Week 2: Finalize the project conception.
Week 3: Finish research.
Week 4: I will set the time and day of the meeting with the primary care center and make plans with the facility regarding the meeting location, menu, and equipment I plan to use for the meeting. Work out the number of guest lists, design, and main invitations.
Week 5: Organize the schedule for the meeting and draw up a manual guide.
Week 6: Draft the input sheet of the research project.
Week 7: Executing the final preparations of the research. Meeting the participants, chief doctor, research assistant, healthcare providers, specialists, and consultants.
Week 8: Process the participation input sheet, evaluate meetings with the staff, and secure a signed thank you letter.

Project Analysis and Evaluation

To achieve the complete data collection on racial comparisons of postmenopausal Osteoporosis between African American and Caucasian women in the United States, I conducted a survey by selecting the total race-matched women of 1000 and compared their age evaluation, BMI, risk factors of Osteoporosis, Dual-Energy X-Ray Absorptiometry (DEXA) Referral, completion rates and Rates of Diagnosis of Osteoporosis, and medications prescribed for Osteoporosis.
Regarding risk factors, Caucasian women had a higher amount of alcohol intake, a family history of fractured bones, and a higher intake of vitamins, calcium, and hormones when compared to African American women. However, African American women had higher numbers of comorbid diseases (i.e., Diabetes mellitus, Hyperthyroidism, Kidney diseases, or Rheumatoid arthritis).
Furthermore, my analysis revealed that African American women were less likely to be prescribed medication for low BMD because African American women begin menopause with a high level of BMD compared to Caucasian women.
Figure 1. Age evaluation and Body Mass Index differences.
AA, African American; C, Caucasian.



Recommendations

The initiative to reduce this disease is related to public awareness. Awareness of this disease should be encouraged among all postmenopausal women, regardless of race, on basic lifestyle modifications such as active physical activity, smoking and alcohol cessation, vitamin D supplements, and calcium intake to strengthen peak bone mass and prevent bone loss during premenopausal and postmenopausal period. Moreover, I believe more advanced research is suggested to investigate new approaches to expand the screening of low BMD for better interpretation of low DXA screening and treatment plans in African American women and to point out specific interference that labels this racial gap among African American and Caucasian women.

Reference

1. A.D Bohannon; Osteoporosis and African American Women. J Women's Health Gend Based Med (2000)
2. Better Health Channel Menopause and Osteoporosis - Better Health Channel
3. Cureus Journal of Medical Science https://www.cureus.com/articles/114102-postmenopausal-osteoporosis-a-literature-review#!/
4. Clinical Biochemistry by Dr. P.K Prabhakar Why Osteoporosis is more common in postmenopausal life? (youtube.com)
5. Fast Facts on Osteoporosis (June 2003). Diseases Statistics http://www.nof.org/osteoporosis/stats/htm
6. Journal of Immunology Research https://www.hindawi.com/journals/jir/2013/575936/
7. MedStar Georgetown Department of Medicine Sequential Therapy in the Treatment of Postmenopausal Osteoporosis (youtube.com)
8. National Library of Medicine https://pubmed.ncbi.nlm.nih.gov/27681935/
9. National Council of Aging Osteoporosis Among Women in the Black Community (ncoa.org)
10. FULLTEXT01.pdf (diva-portal.org)
11. Thieme Open Access s-0042-1757968.pdf (thieme-connect.com)

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