

# Exploring the association between low bone density and depression: a worthy pursuit for the south african context?

Osteoporosis claims a place in the World Health Organization's list of the world's ten most serious diseases<sup>1</sup>, but in spite of this, the disease is not afforded adequate attention in South Africa. According to Bateman<sup>1</sup> most South African medical aids have removed osteoporosis from their list of prescribed minimum benefits, resulting in even fewer people being able to access preventative medicine for this silent disease.

The epidemiology of osteoporosis is cause for alarm. In the USA, osteoporosis now ranks as the second most commonly seen disorder in medical practices.<sup>2</sup> However, this is not merely limited to the USA: It is projected that by 2050, 51% of the world's hip fractures (approximately 3,2 million) will come from the Asian continent. 3 South African is not immune to the high prevalence of this disorder either: osteoporosis is on the rise amongst young adults and an increasing percentage of black women is being affected.<sup>1</sup>

Depression is another widely occurring disorder with a worldwide lifetime prevalence of 20%.<sup>4</sup> Women are generally more prone to the disorder, with twice as many women as men diagnosed with it.<sup>5</sup> Pillay and Kriel<sup>6</sup> determined that 21% of the 422 women over the age of 21 years attending district-level clinical psychology services in the Msunduzi municipality in 2004 suffered from depression. With the disorder's prevalence growing in rural communities, the figure is certain to be higher now.<sup>7</sup>

Depression is frequently cited as a trigger, cause and as a comorbid condition in medical illnesses.<sup>8</sup> Despite solid scientific evidence linking depression to physical disorders<sup>9,10</sup>, further investigations into the mechanisms of such associations are required. This includes exploration of the link between depression and osteoporosis. Although at this stage the research reflects great methodological heterogeneity, associations are increasingly being reported between depression and osteoporosis.<sup>11</sup> Significant results have arisen from studies on both men and women of varying ages and these results should be used as guidelines for further research.

Evidence from studies on older individuals includes Coelho, Silva, Maia, Prata and Barros's<sup>12</sup> community study into the bone mineral density (BMD) and depression status of 102 postmenopausal Portuguese women, and the study of Robbins, Hirsch, Whitmer, Cauley and Harris.<sup>13</sup> Coelho et al.<sup>12</sup>

showed a significant association between levels of clinical depression - as measured by the Beck Depression Index - and osteoporosis. Of the 102 women tested, 47,1% were found to have osteoporosis. These women evinced significantly higher scores on the depression scale ( $p=0.045$ ) than those without osteoporosis. Robbins et al.<sup>13</sup> assessed a population consisting of 1 566 black and white men and women older than 65 years of age. They found the mean total hip BMD to be significantly lower in subjects with higher depression scores, even after adjusting for other risks for the development of osteoporosis ( $p<0.001$ ).

Results of studies on premenopausal women are less consistent. In a study of 25 premenopausal women with major depression and 15 healthy controls, Yazici, Akinci, Sütçü and Özçazar<sup>14</sup> reported a link between low BMD and depression. However, a later study by Yazici and colleagues<sup>15</sup> found no correlation between mild to moderate depression and osteoporosis in a similar sample. This may imply that the severity of depression plays a role.

Research involving male subjects has also yielded results that imply a link between osteoporosis and depression. It is even suggested that the association is more salient in men than in women. The role played by gender in the association between depression and low BMD was examined using data from 5171 participants in the Third National Health and Nutrition Examination Survey (NHANES III).<sup>16</sup> The participants were 20 to 39 years of age and BMD was measured by DEXA. Using the Diagnostic Interview Schedule, the presence of major depressive episode and dysthymia was determined for every individual. After adjusting for factors such as smoking, physical activity and calcium intake, it was concluded that major depressive episodes and dysthymia correlate positively with lower BMD in the proximal femoral region in men, but not in women. The results of Mr. Os, a cohort study conducted amongst 2 000 men in Hong Kong and Singapore, further supports indications that depression and low BMD are linked.<sup>3</sup>

As with any research, these results, when viewed in light of their limitations, begin to generate further research questions. The main limitation of most of these studies is that they are cross-sectional and therefore cannot be used as an absolute measure of causality. In addition, most sample sizes are small and their statistical power therefore limited. Consideration should also be given to the research that refutes a link

between osteoporosis and depression. For example, Reginster, Deroisy, Paul, Hansenne and Ansseau<sup>17</sup> aimed to determine whether or not those women most at risk for developing depression also exhibited the highest risk of developing osteoporotic fractures. The sample consisted of 121 postmenopausal women (aged 48-77 years). No significant correlation was found between BMD of the spine, femoral neck or non-dominant hip and vulnerability for the development of depression.

With fairly strong indications that depression may present a major risk for osteoporosis, it is perhaps time to explore the relationship between the two in the South African context. Although the causal relationship between the two has not yet been confirmed with absolute certainty, any association between them would have a major impact on South African health concerns. From an economic point of view, the expenses related to osteoporosis treatment are tremendous, while productivity is doubtlessly influenced by the fact that osteoporosis accounts for more hospitalization time amongst women over the age of 45 years, than the more public diabetes mellitus, myocardial infarction and breast cancer.<sup>1</sup>

### References

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