

“How to Prevent Fractures ...! ...” Ultrasound of the heel: a novel yet much under-rated method in testing bone density

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Received: November 20, 2015; **Published:** November 20, 2015

The medical world is likely to face an epidemic of hip fractures and other major osteoporosis-related health problems in the elderly population by 2050. The old are likely to consume a majority of the health allocated funds many-fold as they are going to live longer and most other health problems would be better managed.

The reason why osteoporosis will not be taken seriously is because most orthopaedic surgeons are and will continue to remain busy fixing fractures and replacing old knees. A highly specialized and super-speciality oriented medical fraternity is hardly addressing preventive health, much of which needs to be directed at creating awareness in patients, health personnel and doctors of different specialties at a grass-root level of education. The other segment who can help treat are physicians or internal medicine specialists, whose hands are always full with the multiplicity of medical problems existing.

Health checks promoted by corporate hospitals and overseen by physicians miss out on managing osteoporosis effectively as the plethora of medical tests flood the field pushing the issue of preventing fractures to one corner. Patients with borderline osteopenia and no symptoms miss out in these check-ups. Endocrinologists & Rheumatologists who could help are rarely referred to in these checks as they form a small minority and in any case far too few of them are available even in the so-called medical hub of a city like Gurgaon.

It is a different matter of course, that the large majority of middle class and the under privileged, will rarely consider going to a private hospital not catering to the charitable or low income group of patients. These do not have the option or benefit of undergoing an expensive test for Bone Density needed to diagnose osteoporosis, more so as they would not likely opt to come to a doctor for a test if they have no symptom.

Osteoporosis, we all know, has no obvious symptoms. The signs are few and unrecognized, but the target segment is the early post-menopausal female, the thin built, starved or women suffering from anorexia nervosa, the multiparous female or the non-menstruating, young athlete. There are many more features, and a description can take a long chunk of space. But suffice to say, an awareness drive or regular screening check is needed for all females starting from the 30's and males too for that matter. I suggest a special bone density clinic visit to most people seeing me for any orthopaedic or other health related problem. Their healthy attendants are also encouraged to join the test.

A bone density check using an ultrasound device measures the speed of sound (SOS) and the impedance (BUA) and factors them into a stiffness index (SI). The same is expressed in the common terms used to express the test reports as Osteoporosis, Osteopenia and Normal, using T-scores & Z-scores. T-score is Normal if it is > -1.0 meaning less than one standard deviation of a healthy adult girl of 20 years obtained from the data base stored in the software used for the report; a T-score between -1.0 & -2.5 indicates Osteopenia, ie for a standard deviation 1 to 2.5 times less than normal ; a T-score below ($<$) -2.5 indicates Osteoporosis, meaning the patient's test shows bone density 2.5 standard deviations less than that for a normal person. The Z-score is also useful, but not usually relied on to check one's Bone Density; it measures the bone density comparing one to another normal person of the same age group.

Citation: Amod Singh. ““How to Prevent Fractures ...! ...” Ultrasound of the heel: a novel yet much under-rated method in testing bone density”. *EC Orthopaedics* 2.6 (2015): 187-189.

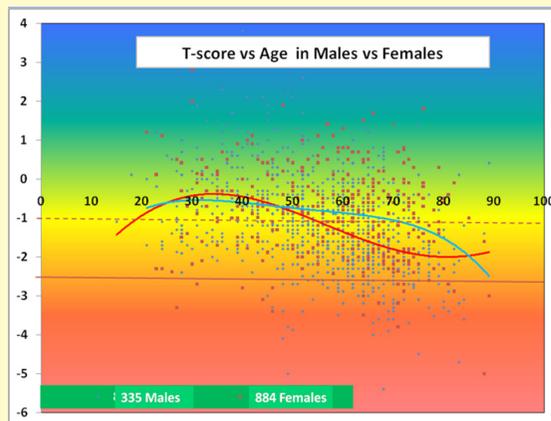


Figure 1

In favour of using the Ultrasound machine for checking Bone Density, one can put forward the following reasons, especially relevant when needed to screen large segments of population.

1. It is a cheaper, portable (small, see picture) & safer machine (it does not use x-rays) to use, compared to the DEXA-scan quoted as the Gold Standard test for checking Bone Mineral density. For this matter, there are possibly far many more ultrasound heel and other devices available compared to the number of DEXA-scanners. This is apparent as such routine check-ups using Ultrasound are far more frequent with increasing public awareness.
2. The tests results are reasonably accurate and reproducible, provided the method is standardised, and the same machine is being repeatedly used, by the same technician as far as possible. The test should be repeated on a few regular members available to the centre organising the test, to ensure reproducibility of results.

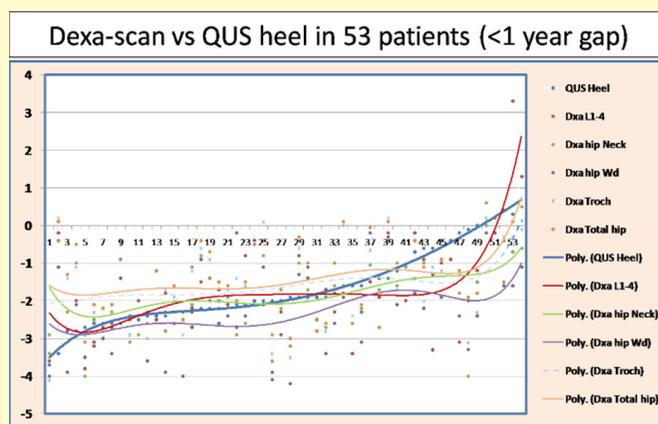


Figure 2

3. The test report obtained by using the Ultrasound or even the DEXA-scanner cannot be used to decide treatment taken without considering a host of other factors termed as ‘Risk Factors’ obtained only by a careful assessment of the patient’s clinical symptoms obtained from history and signs by physical examination. The factors include Age, Sex, Menopausal status and age at menopause, diseases like Diabetes, Rheumatoid, Liver, Kidney, chronic GIT, Thyroid or Gonadal problems, use of medications like steroids, anti-epileptics, anti-convulsants, antacids, positive family history of osteoporosis and trivial trauma fractures, recent frequent falls, a positive Chair test (difficulty in getting up from sitting without support), history of an insignificant (trivial or minor) injury causing a fracture in the hip, spine or wrist or any part of the body. The signs include loss of height (>1-2”), progressive frailness or loss of weight, and evidence of unreported old injuries like deformities in the wrist, stoop, tenderness in the back in a recent unrecognised fracture of the Dorsal or Lumbar spine, and even a lower limb, which seems shorter, and gait with one limb turning outward in a ‘Chaplinesque’ manner.

Osteoporosis is an eminently treatable problem, needing widespread community awareness. It has been reported that 70% of the people who are suffering from osteoporosis could prevent a fracture if treated properly from an early stage.

Early diagnosis forms the most important aspect in treating osteoporosis. As orthopaedic surgeons, we are all too aware of the abysmal success rate and the phenomenal cost involved in managing a fracture particularly in the elderly. It only seems reasonable if we can say “Prevention is Cure”

Volume 2 Issue 6 November 2015

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