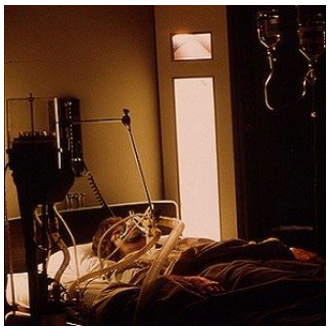
ICU
MANAGEMENT & PRACTICE

Bone Fracture Risk for Critically Ill



New research has found reduced bone mass in patients one year after being hospitalised in the intensive care unit (ICU). The loss of bone density, along with other clinical risk factors assessed by a World Health Organization algorithm, may increase their chances of suffering a fragility fracture, according to researchers.

Neil R. Orford, MBBS, director of the ICU at the University Hospital Geelong in Australia, and colleagues examined 66 patients, average age 68.8 years, who underwent bone mineral density (BMD) testing after leaving the ICU and then again a year later. These patients were matched and compared to patients from the Geelong Osteoporosis Study, a large random population-based sample used to determine normal ranges of BMD over time.

Speaking to *ICU Management*, Dr. Orford explained the key points from this study: "Critically ill patients that require ventilation for greater than 24 hours have accelerated bone loss in the subsequent year, significantly more than age- and gender-matched community controls. This was particularly pronounced in women, who are at higher risk of fragility fractures already."

Dr. Orford's team found that patients who spent at least 24 hours on a breathing machine in an ICU had 1.59 percent less BMD in their lower spines and 1.2 percent less BMD in their thigh bone than expected one year after their hospitalisation. The bone losses were statistically significant in the overall study population and in just women. In men, only the BMD decline in the thigh bone was significant. The findings are reported in the *American Journal of Respiratory and Critical Care Medicine* .

The research team believes the study is the first to look at the long-term effect of ICU treatment on bone density. "There have been studies describing increased bone turnover markers during critical illness, but no long-term studies," Dr. Orford noted. "This probably reflects the fact that research into long-term outcomes after critical illness is a relatively recent area of interest, and that measuring bone density for a year after critical illness is difficult, like a lot of longitudinal research."

The team also looked at two molecular “bone turnover markers” that might affect bone density: type 1 N-terminal procollagen, which helps bone form, and collagen type 1 cross-linked c-telopeptide, which helps bone break down. Their findings suggest that critical illness accelerates bone resorption, the process by which the body breaks down bone and releases calcium and other minerals into the bloodstream. A year later, the researchers found that resorption had normalised, but patients were left with a bone-mass deficit.

Since the study only looked at ICU patients, the research team said they cannot rule out the possibility that other hospitalised patients would experience similar bone losses.

"The impact of accelerated bone loss observed in the year after critical illness is dependent on previous bone health and likely to be of more significance in post-menopausal women," Dr. Orford said. "Investigations of anti-resorptive drugs in larger, multicentre trials, however, are needed before treatment recommendations can be made."

The team is currently designing a phase 2 interventional trial that focuses on women after critical illness, Dr. Orford added.

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Source: American Thoracic Society
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