To the Editor,

I read the article in your journal by Matsumura and colleagues [1] with great interest. Their main findings were, based upon magnetic resonance imaging scans, that after 4 h bed-rest in 20 individuals, increases in lumbar disc water content and decreases in lumbar paravertebral muscle water content occurred. As the authors state in their discussion, the findings of increased disc water content are largely in line with what we might expect, based upon the impact of normal diurnal disc loading patterns on disc water content [2].

However, the changes in paravertebral muscle water content with lying have not, prior to the work by Matsumura and colleagues, previously been studied. It is known that muscle size can be affected by changes in body posture. For example, after 24 h lying [3], a decrease in calf muscle size, but increase in neck muscle size, has been observed. It could be presumed these changes are associated with changes in muscle water content, but this idea was not confirmed by the same authors’ [3] examination of T2-time in the musculature. The existing literature [4–7] largely shows that upon lying, body fluid volume in the legs reduces and increases in the head and thoracic region. Conventional wisdom, at least in discussions with my colleagues, has been that the lumbar region should be a neutral point where no net loss or increase of fluid should occur with lying. For these reasons, the findings of Matsumura and colleagues of decreased paravertebral muscle water content after 4 h lying surprised me.

To help to better understand the findings of Matsumura and colleagues, it would be helpful to have data on the following:

• Based upon existing data [8], it is safe to assume that disc height, but perhaps not anteroposterior disc width [9], would have increased after 4 h of bed-rest. However, was this the case? Can the authors provide data on these variables?
• What was the thickness of the paravertebral muscles before and after 4 h lying? Did it decrease as well, in line with reductions in water content?
• What was the correlation between changes in muscle thickness and changes in their measure of muscle water content? Similarly, what was the correlation between changes in disc morphology and changes in the measure of disc water content?

One of the reasons why this information is important is to understand to what extent losses in muscle size, such as due to disuse atrophy [10], are a result of reversible water loss versus true muscle fibre atrophy. If the authors of the manuscript are in a position to provide the scientific community with these additional data, it would be of great utility.

Conflict of interest I have no conflict of interest to report.

References

1. Matsumura Y, Kasai Y, Obata H, Matsushima S, Inaba T, Uchida A. Changes in water content of intervertebral discs and...


