

Muscle Wasting in ICU Patients is Multifactorial and Requires Thorough Workup

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We read with interest the article by Rajagopal et al. on a prospective, observational cohort study of 50 ICU patients on the correlation between the sequential organ failure assessments (SOFA) score and the thickness of the rectus femoris muscle determined by ultrasound on the 1st and 7th day of the ICU stay.¹ It was found that rectus femoris muscle thickness decreased between day 1 and day 7 in the ICU and that the maximum SOFA score correlated with the difference in muscle thickness between day 1 and day 7.¹ It was concluded that ICU patients experience significant muscle wasting during their ICU stay and that this correlates with disease severity.¹ The study is impressive, but some points require discussion.

The first limitation of the study is the discrepancy between the exclusion of patients who could not consent to the study procedures and the inclusion of 36 patients who underwent mechanical ventilation.¹ Were not those on ventilators sedated enough to consent? Was consent obtained from relatives or carers for these patients? This discrepancy should be resolved.

The second limitation is that all patients consumed the standard amount of calories. Certain medical conditions, such as sepsis, hyperthyroidism, infection, malignancy, or diarrhea, may require a hypercaloric diet. How many patients received hypercaloric nutrition? If the calorie requirement has not been adjusted to the needs, this could be a cause of muscle loss. Those receiving hypercaloric food should be compared with those receiving standard calories.

A third limitation is that no distinction was made between those who were completely immobilized and those who were not intubated and sedated and thus could at least move in bed. One could assume that those who were able to move may not have developed muscle wasting compared with those who were sedated and unconscious. It should also be noted how many of the included patients underwent regular physiotherapy in the ICU particularly those who were mechanically ventilated.

A fourth limitation is that the test–retest reliability of the ultrasound and SOFA score was not reported. Interobserver reliability was also not mentioned. Were the tests repeated by examiners other than the principal investigator? Did the test results from the second examiner remain the same as before?

A fifth limitation is that rectus femoris thickness was not correlated with the body mass index. In individuals with increased initial muscle mass, muscle wasting may follow a different course than in individuals with low muscle mass.

There is a discrepancy between the methods part (patients >65 years were excluded) and the results part (the majority came from the 60 to 70-year-old age-group). Were patients aged >65 years actually excluded? If this was really the case, this discrepancy would have to be resolved.

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Although patients with neuromuscular disorders were excluded from the study, it is conceivable that some of the patients had subclinical myopathy before admission that became clinically manifest during the ICU stay. Did the muscle wasting persist after discharge from the ICU or hospital? How many of the patients included did not recover from muscle wasting even after long-term follow-up?

Overall, the interesting study has shortcomings that raise doubts about the conclusions and their interpretation. Clarifying these deficiencies could improve the results and conclusion of the study. Muscle wasting during ICU stay is multifactorial and can often not be attributed to a single cause. The search for causes of muscle wasting in the ICU must be carried out individually. As soon as the cause of muscle wasting is identified, appropriate treatment must be initiated.

AUTHOR CONTRIBUTION

JF was responsible for the design and conception, discussed available data with coauthors, wrote the first draft, and gave final approval. SM contributed to literature search, discussion, correction, and final approval

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