USING BEDSIDE ULTRASOUND AS A TOOL TO DETECT SARCOPENIA FOR CIRRHOTIC PATIENTS ON TRANSPLANT LIST

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Background: Muscle atrophy is present in as many as 40% of cirrhotic patients and associated with increased morbidity and mortality in those awaiting liver transplantation. A two-fold increase in mortality when compared to non-sarcopenic patients occurs independent of liver dysfunction evaluated using Model for End-Stage Liver Disease (MELD) score which does not incorporate markers of nutritional status, or muscle loss. Ultrasound offers the possibility of a non-invasive and affordable method to evaluate skeletal muscle at the bedside. It has been validated and is emerging as a valuable prognostic indicator of muscle atrophy, thereby improving detection of malnutrition at the individual level.

Aims: We aim to evaluate quadriceps muscle layer thickness (QMLT) using ultrasound in cirrhotic patients waiting for liver transplantation across a range of nutritional risk scores based on Royal Free Hospital Nutrition Prioritizing Tool (RFNS). QMLT will also be compared to functional measures such as hand-grip and blood tests.

Methods: A prospective study started in July 2016 using QMLT measures in a cohort of adult patients waiting for liver transplantation. Written informed consent is obtained on an individual bases. Measures of QMLT are obtained using the ultrasound probe at frequency 9 htz for each thigh at the middle and two-third point from superior iliac spine (SIS). Two residents who received expert training conduct measures. These measures will be compared to a nutrition score as well as synthetic markers of malnutrition, and functional measures of strength and endurance.

Results: Ten patients have been recruited so far. The average QMLT measured at two-thirds from SIS is 3 cm on both legs. The average thickness at the mid-point is 4.2 cm for both legs. Those patients considered at severe risk of malnutrition based on RFNS had either lower, or close to average QMLT when compared to the entire group. Two of the severely malnourished patients had a higher than average measurement which may reflect significant lower-leg edema. Serum vitamin A, and D levels were low in 6 patients and none of those had a higher than average QMLT. Average NaMELD score was 21 in 4 patients with low QMLT. Interestingly, the high RFNS patients had lower NaMELD scores. Hand grip measures on two patients were considered low for both of those who also had low QMLT. Results were consistent between both residents.

Conclusions: Based on this prospective study, QMLT may offer and valuable and objective prognostic tool for detection of sarcopenia and high nutritional risk with consistent results. Significant lower leg edema may present a limitation of this tool. Future work is needed to optimize the ability of QMLT and to determine its importance in assessing the role of lean body mass in cirrhotic populations.
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