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**Title:** Chest wall motion supine and sitting positions in patients with amyotrophic lateral sclerosis

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**Body:** Respiratory muscle function is progressively altered in patients with Amyotrophic Lateral Sclerosis (ALS) leading to chronic respiratory failure. Moreover, diaphragmatic dysfunction starts to occur in supine position in neuromuscular diseases. Studies that analyze the chest wall motion, with special attention to the contribution of the diaphragm, may contribute significantly to earlier detection of ventilation failure. Aim: analyze chest wall motion in supine and sitting positions in patients with ALS and in a sex and age-matched healthy control group. Ten patients with ALS, aged 54 ± 13 years and 10 healthy controls were included. Motion and volume changes of the chest wall and its compartments: rib cage (inspiratory and expiratory muscles) and abdomen (diaphragm and abdominal muscles) were assessed by the optoelectronic plethysmography (OEP, BTS, Milan, Italy). All participants were evaluated in supine and sitting positions during five minutes of quite breathing in each position. Paired t-tests and independent Student t-tests were used, respectively, for intra-group and inter-group analyses. The significance level was set at $\alpha<0.05$ for all comparisons. Results: for both groups, the contribution of the rib cage compartment was significantly lower and the abdominal compartment contribution was greater in the supine compared with the sitting position; lower percentages of contribution of the abdominal compartment were observed in the supine position for the ALS group, when compared with controls. Conclusion: the findings suggested that OEP proved to be a useful tool to identify significant decreases of the diaphragmatic movements in patients with ALS. Partly supported by FAPEMIG and CNPq.