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Efficacy and safety of rapid intermittent correction compared with slow continuous correction with hypertonic saline in patient with moderately severe or severe symptomatic hyponatremia: results from a randomized controlled trial

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Objectives: To compare the efficacy and safety of rapid intermittent bolus correction and slow continuous correction with hypertonic saline in patients with symptomatic severe hyponatraemia.

Methods: DESIGN
Prospective, investigator-initiated, randomized controlled study
PARTICIPANTS
Patients aged >18 years with symptoms and glucose-corrected serum sodium (sNa) ≤125 mmol/L
INTERVENTIONS
A total of 178 patients with symptomatic hyponatraemia were randomly assigned to receive either intermittent bolus infusion or slow continuous infusion by 3% hypertonic saline. sNa levels were measured at every 6 hours for 2 days.
MAIN OUTCOME MEASURES
The primary outcome was the rate of overcorrection defined as follows: increase in the sNa level by >12 mmol/L within first 24 hours or increase in sNa level by >18 mmol/L within 48 hours. The secondary outcomes included efficacy and safety of two other treatment approaches for hyponatraemia with 3% hypertonic saline.

Results: Between 2016 and 2019, the patients (N=178, mean sNa levels 118.2 ± 5.0 mmol/L) were randomly assigned to rapid intermittent bolus correction group (n=87) or slow continuous correction group (n=91). Overcorrection occurred in 17.2% and 24.2% of patients in the rapid intermittent bolus and slow continuous correction groups, respectively (relative risk 1.53, P=0.256). The rapid intermittent bolus correction group had a reduced re-lowering treatment rate compared with the slow continuous correction group (41.4% vs 59.1%, relative risk 1.89, P=0.036). Both groups did not differ in terms of efficacy in increasing the sNa levels or improving symptoms. The rapid intermittent bolus correction group, however, showed better efficacy in achieving the target correction rate within 1 hour (32.2% vs 17.6%, P=0.024).

Conclusions: This randomized clinical trial provided evidence that there was no difference regarding overcorrection between bolus therapy and slow continuous correction with hypertonic saline. However, the bolus therapy demonstrated lower re-lowering treatment rate and better efficacy in achieving sNa within 1 hour than slow continuous correction.