Category: Neuromuscular junction disorders and channelopathies

RCT of Bumetanide in Hypokalaemic Periodic Paralysis (HypoPP) using abductor digiti minimi compound muscle action potential (CMAP) as an objective outcome measure

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Background: Treatment to abort acute attacks of weakness in patients with HypoPP is limited to potassium supplementation. Bumetanide inhibitor effect on the Na-K-2Cl cotransporter may be a potential therapeutic agent based on mouse model studies.

Aims: To assess if 2mg bumetanide can abort an episode of focal hand weakness in patients with HypoPP.

Methods: RCT – ClinicalTrials.gov Identifier: NCT02582476
A focal attack of weakness was induced by hand rest following exercise (McManis protocol). Participants received either placebo or 2mg bumetanide on two different occasions at 40% decrement in abductor digiti minimi (ADM) compound muscle action potential (CMAP) amplitude from the maximum response. Electrophysiological measurements assessed the severity and the duration of the attack following 4h of IMP intake.

Results: Nine participants completed both trial visits. There was no statistically significant difference in CMAP amplitude between the treatment groups at 1h ($p=0.27$, primary outcome). Two participants recovered from the attack of weakness (≤35% decrement in ADM CMAP amplitude from the maximum response) within 4 hours following Bumetanide intake; none recovered following placebo intake (≥40% decrement). There were no serious adverse events.

Conclusions: This is the first time bumetanide was utilised as a treatment option for patients with HypoPP. 2mg Bumetanide was safe but not effective to rescue a focal attack in an immobilised hand in the majority of patients. The McManis test, used here as a procedure and an outcome measurement in a clinical trial for the first time, was well tolerated. Data supports further studies of this agent.