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Title: Validation of raised serum bicarbonate for diagnosis of obesity hypoventilation syndrome

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Body: Introduction: The need for early detection of Obesity Hypoventilation Syndrome (OHS) is clear because delay in the diagnosis and treatment is associated with significant morbidity and mortality. Objective: To validate previously reported raised serum bicarbonate of 27 mmol/l for the diagnosis of OHS in obese patients attending sleep clinic. Methods: A retrospective analysis of prospectively collected sleep clinic data on consecutive obese patients referred to sleep clinic from January 2009 to January 2011 to the North Middlesex University Hospital was performed. Subjects with suspected sleep disorders were evaluated according to our clinic protocol and capillary blood gases were measured in obese subjects (BMI> 30 kg/m2). Results: 525 consecutive patients (mean age 51.44±12.7, 65.71% males, mean BMI 34.59±8.1) were evaluated. A total of 344 (65.52%) were obese (mean age 52.29±12.4, 63.66% males) of which 128 (37.2%) were morbidly obese (BMI>40 kg/m2). 275 (79.94%) obese patients were found to have OSAHS (AHI >5 +symptoms) with mean AHI 32.6±23.9 and ESS 11.7±5.8 and OHS was present in 71 (20.63%) with mean pCO2-6.9±1.1 kPa and HCO3-28.19±2.5 mmol/l. Using a previously suggested serum bicarbonate cutoff value of 27 mmol/l, logistic regression analysis showed serum bicarbonate > 27 mmol had 85% sensitivity and 90% specificity for diagnosis of OHS. Conclusion: OHS is common (20.63%) in obese patients attending sleep clinic and a raised serum bicarbonate more than 27 mmol/l is a good predictor for diagnosis of OHS in our obese sleep clinic population.