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Title: Relationship between mild to moderate renal dysfunction and obstructive sleep apnea: Data from the European sleep apnea database

Dr. Oreste 1070 Marrone marrone@ibim.cnr.it MD ¹, Dr. Salvatore 1071 Battaglia salvatore.battaglia@unipa.it MD ², Prof. Maria Rosaria 1072 Bonsignore marisa@ibim.cnr.it MD ^{1,2} and 1074 On Behalf of the ESADA Study Group ann-christin.l.lundquist@vgregion.se ³. ¹ Institute of Biomedicine and Molecular Immunology (IBIM), National Research Council, Palermo, Italy, 90146 ; ² Biomedical Department of Internal and Specialistic Medicine (diBiMIS), University of Palermo, Palermo, Italy, 90146 and ³ ESADA Office, Center for Sleep and Vigilance Disorders, Internal Medicine, University of Gothenburg, Gothenburg, Sweden .

Body: The relationship between severity of obstructive sleep apnea (OSA) and kidney function was investigated in the European Sleep Apnea Database (ESADA), where clinical, sleep, and biochemical data of patients studied for suspected OSA in 24 sleep centres of 17 European countries are stored. After excluding patients with missing data or extremely high/low creatinine values, data from 8112 subjects (2328 female) with creatinine values ranging between 0.5 and 2.0 mg% were analyzed. Estimated glomerular filtration rate (eGFR) was obtained with the Modified Diet in Renal Disease (MDRD) equation. Patients were subdivided into two groups: group 1 (n = 3709) studied by full polysomnography; group 2 (n = 4403) studied by nocturnal cardiorespiratory monitoring. Altogether, 8.5% subjects had an eGFR<60 ml/min/1.73m². At univariate analysis, eGFR correlated to age, comorbidities and severity of OSA in both groups. At logistic regression analysis, risk factors for eGFR<60 were in group 1: diabetes, female gender, age, body mass index, and lowest nocturnal SaO₂ (r²=0.086); in group 2: hypertension, female gender, age, and lowest nocturnal SaO₂ (r²=0.087). In conclusion, as expected, comorbidities, female gender and advanced age are significant risk factors for low eGFR in subjects with OSA. While traditional severity measures of OSA (apnea/hypopnea index, oxygen desaturation index) did not contribute to low eGFR, more severe nocturnal hypoxia captured by lowest nocturnal SaO₂ appeared as a significant predictor in this large patient cohort. The ESADA study is supported by ResMed and Philips Respironics.