Author's response to reviews

Title: Poor sleep quality is associated with increased arterial stiffness in Japanese patients with type 2 diabetes mellitus

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Author's response to reviews: see over
Dear Editor

Please find enclosed our manuscript “Poor sleep quality is associated with increased arterial stiffness in Japanese patients with type 2 diabetes mellitus”, by Osonoi Y et al., to be considered for publication in Endocrine Disorders.

While sleep quality could worsen cardiovascular risk factors such as glucose and lipid profiles in patients with type 2 diabetes mellitus (T2DM), the relationship between sleep quality and atherosclerosis remains largely unknown. The aim of this study was to examine this relationship.

1. In the age/gender-adjusted model, patients with poor sleep quality tended to be obese, evening type and depressive. On the other hand, other lifestyles including energy intake, smoking consumption, alcohol consumption and physical activity showed no significant trends.

2. With regard to anthropometric data, alanine aminotransferase, fasting blood glucose, HbA1c, systolic blood pressure and urinary albumin excretion tended to be higher in patients with poor sleep quality group in the age/gender-adjusted model. Previous reports also found the relationships between poor sleep quality and poor glycemic control. However, in the those previous studies, other lifestyle factors, such as diet, physical activity, chronotype and depressive state were not fully taken into consideration. Interestingly, in adjustments for other lifestyle factors, we did not find any positive relation between poor sleep quality and any of the cardiovascular risk factors.

3. BaPWV tended to be higher in patients with poor sleep quality group in the age/gender-adjusted model. Interestingly, high baPWV was the only parameter that correlated with poor sleep in a model adjusted for several other lifestyle factors and risk factors for arterial stiffness.
This is the first study showing that increased arterial stiffness is an independent factor associated with poor sleep quality in T2DM patients. Thus, poor sleep quality could be an important target of intervention to prevent the progression of atherosclerosis in T2DM patients in addition to traditional risk factors for atherosclerosis.

These as yet unappreciated findings should interest a broad audience over a spectrum of fields including Diabetes, Atherosclerosis and sleep. We also believe that the data presented here have great implications for a novel importance of intervention to poor sleep quality, in order to achieve appropriate metabolic functions and prevent future CVD in patients with T2DM.

All authors have read and agree to the publication of the manuscript. The manuscript has not been submitted elsewhere. We wrote our manuscript based on editorial policies of Endocrine Disorders.

The authors declare conflict of interest as below. T.M. received research funds from MSD, Takeda and Eli Lilly. T.O. has received lecture fees from Boehringer Ingelheim, Sanofi-Aventis, Ono Pharmaceutical Co., Novo Nordisk Pharma, Kissei Pharma, Mitsubishi Tanabe Pharma, Novartis Pharmaceuticals, Sanwakagaku Kenkyusho, Daiichi Sankyo Inc., Takeda Pharmaceutical Co., MSD, Dainippon Sumitomo Pharm., Kowa Co. and research funds from Novo Nordisk Pharma, Dainippon Sumitomo Pharma. A.K. has received lecture fees from Kissei Pharma, Sanofi-Aventis and Takeda Pharmaceutical Co. M.G. has received lecture fee from Novartis Pharmaceuticals. Y.F. has received lecture fees from Novartis Pharmaceuticals and Eli Lilly, research funds from Novartis Pharmaceuticals, MSD and Takeda Pharmaceutical Co. H.W. has received lecture fees from Boehringer Ingelheim, Sanofi-Aventis, Ono Pharmaceutical Co., Novo Nordisk Pharma, Novartis Pharmaceuticals, Eli Lilly, Sanwakagaku Kenkyusho, Daiichi Sankyo Inc., Takeda Pharmaceutical Co., MSD, Dainippon Sumitomo Pharm., Kowa Co. and research funds from Boehringer Ingelheim, Pfizer, Mochida Pharmaceutical Co., Sanofi-Aventis, Novo Nordisk Pharma, Novartis Pharmaceuticals, Sanwakagaku Kenkyusho, Terumo Corp. Eli Lilly, Mitsubishi Tanabe Pharma, Daiichi Sankyo Inc., Takeda Pharmaceutical Co., MSD, Shionogi, Pharma, Dainippon Sumitomo Pharma, Kissei Pharma, and
Astrazeneca.

Sincerely,

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