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Editorial on paper: The prevalence of sleep-disordered breathing in Northwest Russia – A problem worth knowing about?

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Sleep-disordered breathing (SDB) is highly prevalent. Community data from the United States in the 1990s showed that 24% of middle-aged men and 9% of middle-aged women had SDB based on an apnoea–hypopnoea index (AHI) >5.[1] Driven by rising obesity rates, estimates in the United States increased from 26.4% to 33.9% of the population from 1988–1994 to 2007–2010.[2] Obstructive sleep apnoea (OSA), which is the most common cause of SDB, is now estimated to effect almost one billion individuals worldwide.[3]

In Russia, 40 million individuals (51.4%) and 20 million individuals (25.6%) were estimated to have an AHI > 5 or >15 respectively.[3] However, this estimate was calculated from populations outside of Russia as studies from Russia were lacking. In this journal, Khokhkrina and colleagues,[4] report results from the ARKH sleep study, providing the first estimates of the prevalence of SDB in Russia, based on the updated American Academy of Sleep Medicine 2012 guidelines.[5]

Khokhkrina and colleagues used a two-step sampling technique, with 1050 responders from a random selection of 2659 individuals from the general population aged between 30 and 70 years old. They then performed home sleep studies on all individuals who agreed to participate ($n = 404$) who were deemed to be high risk for OSA (body mass index (BMI) $\geq$25 kg/m^2 and/or Epworth Sleepiness Score (ESS) $\geq$8) and random selection of 50 low-risk individuals who did not meet these criteria. They estimated that SDB affects 48.9% (95% confidence interval (CI) or 95% CI 45.8–51.9), 18.1% (95% CI 15.9–20.6) or 4.5% (95% CI 3.2–5.8) of the population based on AHI criteria of >5, >15, or >30, respectively. Khokhkrina and colleagues are to be commended for their efforts in showing the prevalence of OSA in Russia.

Khokhkrina and colleagues used a multichannel home sleep study, which is validated against polysomnography (PSG).[6] Home sleep studies tend to underestimate the AHI,[7] and this probably explains why their estimates were lower than the findings of HypnoLaus study which used PSG and estimated that 83.8% of men and 60.8% of women had an AHI > 5 community dwelling individuals in Switzerland.[8]

There are several intriguing observations in the data from Khokhkrina and colleagues. First, excessive sleepiness, defined as an ESS $\geq$ 10, was similar among those without SDB (24.6%), compared to those with mild (24.7%), moderate (20.5%) SDB and only trended towards an increase in those with severe (30%) SDB. Sleep-related quality of life, as measured by the Pittsburgh Sleep Quality Index, was not significantly worse in those with moderate-to-severe SDB than those with no or mild SDB. While SDB is therefore identified as highly prevalent, it does not always cause symptoms as seen in OSA syndrome. The findings of similar levels of sleepiness and quality of life suggest that the severity of OSA should not be used to determine which patients with symptoms should

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receive treatment. Continuous positive airway pressure (CPAP) has been shown to be effective in symptomatic patients, regardless of the AHI.[9,10]

Second, Khokhkrina and colleagues found similar levels of OSA in men and women. There were similar proportions of women with moderate-to-severe SDB (61.4%) as those with no or mild SDB (58.1%). This result contrasts with findings elsewhere where SDB was 1.5–3 times more prevalent in men.[2,8] The exact reasons for this difference are not clear. It is worth noting that this comparison is not adjusted for age or BMI, which are both risk factors for SDB, with age being a particularly strong risk factor in women.[8]

The authors go on to look at co-morbidities previously associated with SDB. While the authors show that moderate-to-severe OSA was significantly associated with increased age adjusted odds of arterial hypertension (odds ratio (OR) 2.09, 95% CI 1.47–5.73), it was no longer significant following adjustment for BMI, type 2 diabetes mellitus (T2DM) and heart failure. It should be noted that only 101 patients with moderate-to-severe OSA were studied, limiting the conclusions that can be drawn from these data. It has been established elsewhere that moderate-to-severe OSA is an independent risk factor for arterial hypertension and cardiovascular disease.[11,12]

Khokhkrina and colleagues have shown the high prevalence of SDB in Russia and its association with cardiovascular disease. Russia also has a high prevalence of cardiovascular disease compared with the United States and the United Kingdom.[13] The authors state their opinion that 'supplementary interventional studies are required to understand if treating asymptomatic SDB patients (and past which cut-offs of OSA severity) will improve cardiovascular prognosis'. This raises the question as to the merits of screening to find asymptomatic cases in the population.

Screening for SDB in a high cardiovascular risk population fulfils several key screening principles.[14] SDB and cardiovascular disease are important health problems, have a known natural history, have an asymptomatic state and have a suitable screening test with home polygraphy which is acceptable to the population. There are however issues with screening for SDB. Screening high-risk patients with prior cardiovascular disease for SDB has not been shown to improve cardiovascular risk in randomised controlled trials (RCTs),[15,16] and CPAP acceptance is low among minimally symptomatic individuals.[15,17] Therefore, to date there is insufficient evidence to support screening to find asymptomatic cases of SDB to treat with CPAP.

Khokhkrina and colleagues have shown that SDB is highly prevalent in the community in a Russian population. The high prevalence of both cardiovascular disease and SDB makes the Russian population suitable to determine if screening to find asymptomatic cases of SDB can lead to improved cardiovascular end points. Future work in this population with longitudinal and interventional studies will be of interest to examine the relationship between SDB, cardiovascular risk and CPAP treatment in a population where both SDB and cardiovascular disease are highly prevalent.

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