Screening for sleep apnoea: achieving both sensitivity and specificity

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Medicare criteria may hinder timely diagnosis and treatment of patients

This issue of the *MJA* includes a timely analysis of the value of questionnaires in screening for obstructive sleep apnoea (OSA) in primary care.[1] It has particular relevance for contemporary Australian health care, given the new Medicare provisions for pre-test OSA screening. The study by Senaratna and colleagues is valuable for health care providers and administrators because it illustrates the limitations of questionnaires for screening, let alone for diagnosing, OSA.

The combination of adequate sensitivity and specificity appears elusive when using screening questionnaires. As the authors point out, high sensitivity is required to ensure that people with the condition are not inappropriately ruled out (false negatives), as is at least moderate specificity to avoid ruling in healthy people too readily (false positives). The specificity of the STOP-Bang questionnaire and similar tools is disappointingly low at cut-off values that achieve high sensitivity, leading to high false positive rates.[2,3] Senaratna and colleagues found that adding the criterion of an Epworth sleepiness scale score of at least 8, indicating at least moderate daytime sleepiness, increases the specificity of screening, but at the cost of sensitivity.[1] Diagnosis demands a rigorous combination of both features, so a positive screening result must be followed by specific diagnostic testing; in this case, a study of breathing during sleep.

In this light, it is interesting to note the decision by the Australian Department of Health to amend its Medicare Benefits Schedule (MBS) provisions. It now recommends using questionnaires for screening by primary care physicians in the direct referral process for polysomnography sleep studies, and sets as the screening benchmark the combination of a STOP-Bang questionnaire score of at least 4 (or an OSA-50 questionnaire score of at least 5 or a Berlin Questionnaire high risk score) with an Epworth score of 8 or more.[4] As the study by Senaratna and colleagues indicates, however, half the patients with clinically relevant OSA do not meet the Medicare criteria,[1] so they may be a roadblock to timely diagnosis and treatment for a substantial proportion of patients with this common and problematic condition. The attempt to formalise pre-test screening based on questionnaires fails to account for their limitations, and may therefore reduce access to clinical investigation for many people with OSA.

In the absence of better screening tools, a more balanced approach might be to employ a high sensitivity questionnaire (such as STOP-Bang with a threshold value of 3)[2] without Epworth scores, and, if the result indicates a high pre-test probability of OSA, to add low cost diagnostic testing to increase specificity.[3] In this regard, it is time to reconsider the MBS subsidising low cost levels 3 and 4 diagnostic testing for OSA, a measure hitherto rejected by the Australian Department of Health, but adopted 10 years ago by Medicare in the United States.[5,6] The utility of such a two-step approach in Australian primary care has been reported: the combination of questionnaire and overnight oximetry (a level 4 test) accurately identified moderate to severe OSA in a high proportion of patients.[7]

Relevant to the question of low cost diagnostic testing, Senaratna and his colleagues employed an ApneaLink home sleep testing device as the diagnostic standard against which the performance of the questionnaires was judged. The device records respiratory parameters (airflow and arterial oxygen saturation) in a simple, inexpensive, and highly portable manner. While its performance does not match that of the gold standard, level 1 laboratory polysomnography (which also assesses many other parameters, including sleep state), it and similar devices are useful diagnostic tools, particularly in patients with more severe OSA.[6] Combined with clinical evaluation and a positive questionnaire result, these devices allow diagnoses to be made and the severity of OSA to be quantified in many patients without recourse to more expensive, less readily available polysomnography.

The value of combining questionnaire responses with data from simple home-based devices for achieving a reasonable combination of sensitivity and specificity should be further investigated.[8] However, a staged approach to diagnosis — a questionnaire with high sensitivity for ruling in the possibility of disease followed (if indicated by the response) by a simple home-based sleep study to increase specificity and to confirm diagnosis, with polysomnography reserved for cases in which diagnosis remains unclear — is worth pursuing.

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