

Making Meaningful Use of Electronic Health Data

Commentary on Hudgel et al. Assessment of multiple health risks in a single obstructive sleep apnea population. *J Clin Sleep Med* 2012;8:9-18.

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While long-term outcomes in clinical obstructive sleep apnea (OSA) cohorts have been reported from other nations, these data have been difficult to gather in the US, both because sleep care is often fragmented from other aspects of health care and because over time, patients frequently change their health care providers. In this issue, Hudgel et al. take advantage of the Henry Ford Health System, which provides multidisciplinary care and has been able to retain their patient population for much longer time periods than typically occurs in the U.S.¹ Furthermore, Henry Ford was an early user of an integrated electronic health record (EHR) system. Adoption of EHR systems has recently been promoted through the 2009 Health Information Technology for Economic and Clinical Health (HITECH) act as a means to improve quality of care.² Recognizing that an EHR by itself does not improve clinical outcomes,³ financial incentives have been offered to ensure “meaningful use.”

Using their EHR, Hudgel et al. identified all OSA patients diagnosed in their sleep clinic. Being able to electronically generate a patient panel with a particular diagnosis is one of the criteria for meaningful EHR use.⁴ The investigators then abstracted data on comorbid conditions, treatment information, and the development of incident cardiovascular outcomes or death. There was a high level of data completeness with, for example, only 2% of records missing height information. This contrasts favorably against a recent national survey, which found 49% of physician records are missing height information.⁵ Unfortunately, while all of this information was captured in the EHR, it could not be easily extracted in an electronic format. Rather, a research technician needed to manually abstract each of the relevant variables. From this standpoint, the EHR failed in allowing meaningful use. The effort required for data abstraction likely explains the investigators’ decision to limit analysis to only patients diagnosed in 2001-2002, thus substantially limiting the sample size.

Overall, the investigators found no significant impact of OSA on any of the outcomes evaluated. However, a trend for greater mortality in severe apneics was seen and similar to prior studies,^{6,7} this association was strongest in younger men. These consistent findings of increased susceptibility in younger and male patients highlight the need for mechanistic insights that can explain this heterogeneity. The authors also found a protective effect of regular continuous positive airway pressure

(CPAP) use in severe apneics with a hazard ratio (0.37) identical to that previously reported in a Spanish clinical cohort.⁸ In contrast, no evidence was found for an adverse effect from mild OSA and no benefit attained with treatment.

In interpreting these findings, one should recognize that the lack of statistical significance does not necessarily indicate a lack of effect. Rather, as the authors note, the study was only powered to detect a doubling in risk. Well-established cardiovascular risk factors such as hypertension have effects smaller than this,⁹ and it is notable that hypertension and diabetes were not significant predictors of cardiovascular outcomes in this study. This has been an issue in prior OSA studies as well.^{10,11} In order to determine whether a clinically meaningful effect of OSA exists on cardiovascular risk and whether that effect truly differs by gender or age, cohorts that are one to two orders of magnitude greater than what has been achieved thus far are needed. Such large cohorts will be prohibitively expensive to assemble de novo making it an imperative to have EHR systems that can cheaply and efficiently allow analyses of patient populations. Furthermore, while randomized trials are clearly needed to definitively establish a cardiovascular benefit of CPAP use, it is unlikely that trial data alone will ever be able to answer questions of efficacy in every subgroup—the elderly, women, mild OSA, etc. Thus, there is a need here as well for well-designed observational studies using clinical data.

Without a commitment to populate the EHR with accurate information and then provide physicians easy access to relevant data, the EHR cannot improve clinical outcomes. From a research standpoint, beyond collecting the necessary data, EHR systems need to ensure these data can be searched and extracted in a readily accessible manner. Then the onus is on the research community to make meaningful use of the information we gather on our patients every day.

CITATION

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DISCLOSURE STATEMENT

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