

Review: Medical history, physical examination, and routine tests are useful for diagnosing heart failure in dyspnea

I read with interest the commentary provided by Dr. Wyer regarding the value of dyspnea on exertion in congestive heart failure (HF) (1). The data reveal the pooled positive likelihood ratio (+LR) for dyspnea on exertion to be 1.3 and the negative likelihood ratio (–LR) to be 0.48. He states, “Surprisingly, the presence of dyspnea on exertion has little effect on raising the likelihood of HF, although as expected, its absence lowers HF likelihood.” I concur that dyspnea on exertion is not useful in raising the probability for HF considering the low +LR, but I disagree that the absence of dyspnea on exertion lowers the likelihood of HF below a threshold probability where neither treatment nor further diagnostic intervention is warranted. If hypothetical pretest probabilities for HF are 0.60, 0.40, and 0.20, the posttest probabilities for a negative test (lack of dyspnea on exertion) would decrease only to 0.42, 0.24, and 0.11, respectively. I doubt that any clinician would feel comfortable abandoning the hypothesis of HF especially at pretest probabilities of 0.60 and 0.40. Using the same pretest probabilities of 0.60, 0.40, and 0.20 and the –LR for serum B-natriuretic peptide (BNP) of 0.11, the resulting posttest probabilities would be 0.14, 0.07, and 0.03, clearly providing a firmer basis for not pursuing the diagnosis of HF.

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Reference

1. Review: Medical history, physical examination, and routine tests are useful for diagnosing heart failure in dyspnea. [Abstract]. ACP J Club. 2006 Mar-Apr;144:49. 16539364 Abstract of: Wang CS, FitzGerald JM, Schulzer M, Mak E, Ayas NT. Does this dyspneic patient in the emergency department have congestive heart failure? JAMA. 2005;294: 1944-56.

IN REPLY:

Dr. Nardone is correct that the statement in the commentary regarding the effect of the presence or absence of dyspnea on exertion could be misleading to the extent that individual elements of clinical assessment are held to the same standard that we expect of other diagnostic tests. Neither the presence nor the absence of this predictor definitively rules in or rules out HF as the cause of dyspnea. Indeed, for a test result to exert a defining effect on the likelihood of a disease, its LR should be > 10 for a positive result or < 0.1 for a negative result (1).

This expectation may be unrealistic for clinical findings used in the bedside evaluation of patients. If one scans a cross-section of the installments in the *JAMA* Rational Clinical Examination series, of which the article by Wang and colleagues (2) is a part, individual assessments with very high or low LRs are, by far, the exception.

This is also true of the results of the Wang review. Only the presence of a third heart sound (LR 11), an assessment that is problematic in most busy emergency departments (EDs), qualifies as a “useful test” for HF by standard criteria.

Should we reject almost all clinical assessments as relatively useless? I rather believe that, as clinicians at the bedside, we rarely should look to a single assessment to make or break a diagnostic hypothesis. Instead, in a setting in which we are gathering information from the equivalent of a large number of diagnostic tests, we need to be able to distinguish those that have some effect from those that have none, and the directions of that effect.

I found the results reported by Wang and colleagues for presence or absence of dyspnea on exertion as a predictor of decompensated HF to be surprising from this standpoint. In my experience in discussing such patients in the ED with other attending physicians, and in receiving house officer presentations of these cases, I am impressed that most clinicians perceive the presence of this predictor to be more useful than its absence. If we consider a patient with a pretest probability of 50% (odds of 1) to embody “perfect clinical uncertainty,” then, using the same arithmetic as Dr. Nardone, the presence of dyspnea on exertion in such a patient raises the odds to 1.3, yielding a posttest probability of 56%, which I agree is a clinically meaningless change in likelihood. However, the absence of dyspnea on exertion lowers the odds of failure in the same patient from 1 to 0.48, resulting in a posttest probability of 32%. This is a nondefinitive but clinically significant change, which may be usefully taken into account in the course of assessing the utility of a more definitive test, such as BNP. Furthermore, looking over the full results reported by Wang and colleagues, no other negative clinical assessment appreciably exceeds the power of the absence of dyspnea on exertion in lowering the target likelihood, and only absence of history of HF and a negative Valsalva maneuver are characterized by LRs < 0.5 .

What I find useful in the review by Wang and colleagues, and throughout the parent *JAMA* series, is that it allows me to “reset” my map of heuristics of nondefinitive assessments in the course of gathering bedside information from patients in the ED and to determine which questions and answers are potentially useful and in which direction.

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References

1. Guyatt GH, Rennie DR, eds. Users' guides to the medical literature: a manual for evidence-based practice. Chicago: AMA Press; 2002.
2. Wang CS, FitzGerald JM, Schulzer M, Mak E, Ayas NT. Does this dyspneic patient in the emergency department have congestive heart failure? JAMA. 2005;294:1944-56.