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Pretest probability assessment derived from attribute matching

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Abstract:

Background Pretest probability (PTP) assessment plays a central role in diagnosis. This report compares a novel attribute-matching method to generate a PTP for acute coronary syndrome (ACS). We compare the new method with a validated logistic regression equation (LRE). Methods Eight clinical variables (attributes) were chosen by classification and regression tree analysis of a prospectively collected reference database of 14,796 emergency department (ED) patients evaluated for possible ACS. For attribute matching, a computer program identifies patients within the database who have the exact profile defined by clinician input of the eight attributes. The novel method was compared with the LRE for ability to produce PTP estimation <2% in a validation set of 8,120 patients evaluated for possible ACS and did not have ST segment elevation on ECG. 1,061 patients were excluded prior to validation analysis because of ST-segment elevation (713), missing data (77) or being lost to follow-up (271). Results In the validation set, attribute matching produced 267 unique PTP estimates [median PTP value 6%, 1st–3rd quartile 1–10%] compared with the LRE, which produced 96 unique PTP estimates [median 24%, 1st–3rd quartile 10–30%]. The areas under the receiver operating characteristic curves were 0.74 (95% CI 0.65 to 0.82) for the attribute matching curve and 0.68 (95% CI 0.62 to 0.77) for LRE. The attribute matching system categorized 1,670 (24%, 95% CI = 23–25%) patients as having a PTP < 2.0%;

28 developed ACS (1.7% 95% CI = 1.1–2.4%). The LRE categorized 244 (4%, 95% CI = 3–4%) with PTP < 2.0%; four developed ACS (1.6%, 95% CI = 0.4–4.1%). Conclusion Attribute matching estimated a very low PTP for ACS in a significantly larger proportion of ED patients compared with a validated LRE.

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