Systematic review and meta-analysis of the discriminatory performance of risk prediction rules in febrile neutropaenic episodes in children and young people


CRD summary
This 2009 review could not conclude that any clinical decision rule for the risk of infection, in children who developed febrile neutropenia while being treated for cancer, was more effective or reliable than any other. An individual patient data meta-analysis was needed.

Objectives
To summarise the evidence on the discriminatory ability and predictive accuracy of clinical decision rules for the risk of infection in children who had developed febrile neutropenia while being treated for cancer.

Review methods
Ten databases, including DARE, MEDLINE and EMBASE, were searched up to February 2009, for studies of clinical decision rules for children from birth to 18 years old, who had febrile neutropenia.

Case-control studies were excluded. The main outcome was the performance of the rule recorded in a 2x2 or 2x3 table. Where sufficient, the data were combined in random-effects meta-analyses.

Two reviewers independently screened studies for inclusion. Quality was assessed, using 11 of the 14 QUADAS criteria, and the data were extracted by one reviewer and checked by another. Disagreements were resolved by consensus.

Results of the review
Twenty studies of 16 rules were included, covering 8,388 episodes of febrile neutropenia. Eight studies were prospective, 11 were retrospective, and one was a retrospective analysis of prospective data. Quality varied.

Sixteen studies tried to derive a rule, but they varied by population, predictors, and outcomes.

The performance of the rules varied. The Rackoff rule (five studies) discriminated between individuals at low, moderate or high risk of bacteraemia; predictive value 6% (95% CrI 1 to 34) low risk, 18% (95% CrI 3 to 37) medium risk, and 49% (95% CrI 6 to 84) high risk. The Santolaya rule (two studies) was moderately able to differentiate between low and high risk of invasive bacterial infection; predictive value 13% (95% CI 9 to 13) low risk and 72% (95% CI 68 to 75) high risk. For the other rules, there were insufficient data for meta-analysis.

Conclusions
This review could not conclude that any clinical decision rule was more effective or reliable than any other. An individual patient data meta-analysis was needed.

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This is a high quality systematic review involving CRD that meets the criteria for inclusion on DARE. This structured abstract presents a brief summary of the review methods, the results and conclusions.