Medical Xpress

Computer model better than clinical judgment for diagnosing fever in young children

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A computerised diagnostic model outperforms clinical judgement for the diagnosis of fever in young children, and may improve early treatment, finds a study published in the British Medical Journal today.

Fever (or febrile illness) is a common symptom in children, especially in those under five years of age, but it can be difficult to diagnose the correct cause. Yet physicians need to be able to distinguish minor viral illnesses from serious bacterial infections such as pneumonia, urinary tract infection and meningitis.

Current diagnostic processes and clinical scoring systems are often inadequate, so there is a real need for an accurate acute clinical decision making tool that takes into account all the signs and symptoms associated with serious causes of febrile illness.

So a team of researchers in Australia set out to develop and test a computerised model to distinguish serious bacterial infections from self limiting non-bacterial illnesses.

The study involved over 15,000 healthy children under five years of age presenting to the emergency department of a large children's hospital over a two-year period with a febrile illness (a body temperature of 38ºC or more in the previous 24 hours).

A standard clinical evaluation was performed by physicians and serious bacterial infections were confirmed or excluded using standard tests and follow up. The signs and symptoms noted by the physicians were then combined in a diagnostic model and the results were compared.

The data show that urinary tract infection, pneumonia and bacteraemia (bacteria in the blood) occur in about 7% of young children with a fever, but only 70-80% of these children are prescribed antibiotics on initial consultation and 20% of children without an identified bacterial infection are probably over-treated with antibiotics.

The performance of the diagnostic model for each infection was acceptable or better than physician evaluation.

The authors point out that almost all (95%) of these children had the appropriate tests, and that some doctors routinely delay giving antibiotics until test results are known, so this may help to explain the initial under-treatment. However, about two thirds of children who were not treated were subsequently prescribed antibiotics.

They conclude: "By combining routinely collected clinical information into a statistical model, we have demonstrated that a clinical diagnostic model may improve the care of children presenting with fever who have suspected serious bacterial illness."

"This study reinforces the importance of measuring vital signs and assessing a child's overall state of illness," say general practitioners Matthew Thompson and Anne Van den Bruel in an accompanying editorial. But, they caution that, "before widespread implementation, we will need to have evidence showing the effect of using such a model on patient management and outcomes."