We developed a diagnostic prediction model for BSI in febrile pediatric oncology patients without severe neutropenia. External validation is warranted before use in clinical practice.” Esbenshade et al (2014).

Reference:


Prediction model for diagnosing blood stream infections in children with cancer
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Abstract:

Background: Pediatric oncology patients are at increased risk for blood stream infections (BSI). Risk in the absence of severe neutropenia (absolute neutrophil count ≥500/µl) is not well defined.

Procedure: In a retrospective cohort of febrile (temperature ≥38.0° for >1 hr or ≥38.3°)
pediatric oncology patients with ANC ≥500/µl, a diagnostic prediction model for BSI was constructed using logistic regression modeling and the following candidate predictors: age, ANC, absolute monocyte count, body temperature, inpatient/outpatient presentation, sex, central venous catheter type, hypotension, chills, cancer diagnosis, stem cell transplant, upper respiratory symptoms, and exposure to cytarabine, anti-thymocyte globulin, or anti-GD2 antibody. The model was internally validated with bootstrapping methods.

Results: Among 932 febrile episodes in 463 patients, we identified 91 cases of BSI. Independently significant predictors for BSI were higher body temperature (Odds ratio [OR] 2.36 P < 0.001), tunneled external catheter (OR 13.79 P < 0.001), peripherally inserted central catheter (OR 3.95 P = 0.005), elevated ANC (OR 1.19 P = 0.024), chills (OR 2.09 P = 0.031), and hypotension (OR 3.08 P = 0.004). Acute lymphoblastic leukemia diagnosis (OR 0.34 P = 0.026), increased age (OR 0.70 P = 0.049), and drug exposure (OR 0.08 P < 0.001) were associated with decreased risk for BSI. The risk prediction model had a C-index of 0.898; after bootstrapping adjustment for optimism, corrected C-index 0.885.

Conclusions: We developed a diagnostic prediction model for BSI in febrile pediatric oncology patients without severe neutropenia. External validation is warranted before use in clinical practice.

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