"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:

Esbenshade, A.J., Di Pentima, M.C., Zhao, Z., Shintani, A., Esbenshade, J.C., Simpson, M.E., Montgomery, K.C., Lindell, R.B., Lee, H., Wallace, A., Garcia, K.L., Moons, K.G.M. and Friedman, D.L. (2014) Development and validation of a prediction model for diagnosing blood stream infections in febrile, non-neutropenic children with cancer. Pediatric Blood & Cancer. October 18th. .

Prediction model for diagnosing blood stream infections in children with cancer http://ctt.ec/bz2tO+ @ivteam #ivteam

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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.