UTILITY OF ANAEROBIC AND FUNGAL CULTURES IN THE PEDIATRIC ONCOLOGIC POPULATION

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Background
Traditionally if there is a concern for sepsis in a pediatric patient an aerobic blood culture is obtained exclusively.
In addition to innate immunologic concerns, chemotherapy and transplant associated mucositis places oncologic patients at a unique risk for enteric translocation and therefore an increased theoretical risk of anaerobic sepsis. Furthermore, high prevalence of broad spectrum antimicrobial use places patients at an increased risk for disseminated fungal infections.
In our institution, a febrile or ill appearing oncology patient will often be evaluated with aerobic, anaerobic, and fungal cultures. This is especially true in patients with persistent fevers without a clear etiology on empiric antimicrobial therapy. It is not uncommon for all three cultures to be repeated multiple times per admission.
Although this practice may seem sensible, there is to our knowledge little evidence to confirm its necessity in this population.

Methods
A retrospective review of all blood cultures originating from our institutions oncology and HSCT ward was obtained from January 2010 to April 2017. Duplicate cultures (obtained on consecutive days with repeat organisms) were excluded.
Each anaerobic and fungal culture was then evaluated for corollary positive aerobic cultures obtained exclusively. For each unique case, clinical narratives were compiled including demographic data, chemotherapy regimens, central line access.

Results
A total of 10,950 cultures were evaluated—6579 aerobic cultures, 2391 anaerobic cultures, 1980 fungal cultures.

Discussion
Over a seven year period of routinely obtaining anaerobic and fungal cultures for febrile oncology patients only 42 unique anaerobic and 23 unique fungal cultures were identified although over 4000 cultures were sent. New clinical data was only generated on 1.7% of all anaerobic cultures and 1.2% of all fungal cultures obtained.
Given the predominance of facultative anaerobes (only seven obligate anaerobes identified) this may simply reflect the results of increased blood sampling rather than added utility of the anaerobic growth medium. Similarly, although there were few positive fungal cultures, the majority of these are of unclear clinical significance. As a whole these findings suggest judicious use of selective growth media in cases with higher clinical suspicion may be more useful than empiric evaluation.

Next Steps
Clear protocols for risk stratification for invasive fungal disease and anaerobic infections can be instituted as part of clinical pathways. Recommended blood volumes for aerobic cultures can also be delineated. Prospective data can then be used to compare improved percentage yields and more favorable cost-benefit profiles. Still, increased daily blood draw volumes may become a limiting factor. Ensuring optimized volumes in aerobic blood cultures may increase diagnostic yield.

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References