(166) Novel Methods for the Identification of a Rare Disease, Hemophagocytic Lymphohistiocytosis (HLH)

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8:00 AM – 1:30 PM ADT

Poster Session C – Rare Disease

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Background: Hemophagocytic lymphohistiocytosis (HLH) is a rare, life-threatening hyperinflammatory syndrome. While ICD codes are available for HLH-related conditions, identifying and diagnosing HLH is challenging due to complex diagnostic criteria, a high mortality rate, and heterogeneous etiology and presentation, leading to inconsistent use of these codes.

Objectives: The objective of this study was to develop novel strategies to compile a retrospective cohort of HLH patients at a large US healthcare system. This cohort will be used to help refine methods for the identification and diagnosis of HLH.

Methods: A large US healthcare Electronic Medical Record (EMR) system was queried 2009-May 2022 to identify potential patients. Three methods were developed for patient identification. Method 1 identified patients with any mention of an HLH-related ICD code (ICD-9 288.4; ICD-10 D76.1, D76.2, D76.3). Method 2 identified patients with elevated ferritin values (>1,000 ng/mL or >10,000 ng/mL) or a sCD25 test (known predictive markers of HLH). Method 3 identified patients with etoposide and dexamethasone treatment, removing patients receiving this treatment as part of a chemotherapy regimen. A clinician reviewed a random sample of patients identified by each method for HLH diagnosis using expert clinical judgment; the cohorts used for random sampling were unique, such that patients identified with Method 1 were removed from the Method 2 cohort used for random sampling and patients identified with Methods 1 and 2 were removed from the Method 3 cohort used for random sampling.

Results: Method 1 (N=327) was found to be predictive for HLH, with 17% of the random 20% sample confirmed with HLH. The following cohorts within Method 2 (N=1,057) were found to be predictive of an HLH diagnosis: ferritin >10,000 ng/mL and any sCD25 test (N=42, 13% of patients in the 20% random sample confirmed with HLH) and patients with ferritin 1,000-10,000 ng/mL and any sCD25 test (N=94, 17% of patients in the 20% random sample confirmed with HLH). Random 10% sampling of the cohorts of patients with 1) any sCD25 test and no ferritin >1,000 ng/mL (N=374) and 2) ferritin >10,000 ng/mL and no sCD25 test (N=547) were found to have few patients with HLH (N=1 or 3% and N=1 or 2%, respectively). Chart review of a random 20% sample of patients within Method 3 (N=86) found no cases of HLH. If the diagnosis ratios are extrapolated to the full cohorts, Method 2 has the potential to identify an additional 95% of HLH patients versus ICD codes alone. Results of the full chart review will be presented.

Conclusions: Our expanded algorithm captured a substantial number of patients that would have been missed using ICD codes alone for identification, indicating a potential underestimation of HLH incidence.