METHODOLOGICAL CHALLENGES IN THE ESTIMATION OF THE INCIDENCE RATE OF RARE DISEASES FROM SPECIALIZED CENTERS: LESSONS LEARNED FROM A STUDY OF MULTICENTRIC CASTLEMAN’S DISEASE

Authors: Teltsch DT, Swain RS, Desrosiers M-P, Robinson Jr, DW, Payne KA, Reynolds MW
Affiliations: United BioSource Corporation
Janssen Global Services

Objectives: Studies that estimate incidence of very rare diseases (less than 1 in 100,000 of the general population) often use cases seen at specialized centers. However, multiple potential sources of both systematic error and random error complicate this estimation. We calculated the incidence rate of Multicentric Castleman’s Disease (MCD) based on data from two specialized centers. Our objective is to describe the main challenges of incidence estimation of rare diseases in general, and specifically of MCD, and to suggest how to improve the assessment accuracy.

Methods: All the patients that were newly diagnosed with MCD at 2 centers were included. Patients’ locations were identified from the first 3 digit of their zip codes and mapped using a Geographical Information system (GIS). Catchment areas for each center were defined based on spatial patterns and center-specific clinician input. CENSUS data were used to estimate the size of the reference population and to calculate the crude and stratified incidence rates.

Results: Uncertainty resulted from small sample size; center-specific population features and referral patterns; under-diagnosis and difficulty of diagnosis; association between disease risk factors and proximity to the centers; and difficulty with defining a catchment area to establish the relevant population denominator.

Analysis involved a trade-off between the number of patients included in a catchment area and catchment area definition, with clearer geographical boundaries that maximized the proportion of MCD patients in the population represented in the center.

Conclusions: Small sample sizes in combination with multiple potential sources of error challenge an accurate estimate of incidence. Finer definitions of each center catchment area further reduce the number of included cases but can improve the accuracy of the incidence estimate.
Research Topic: Research on Methods (RM); Statistical Methods (SM)
Disease/Disorder for Research Submissions: Rare Diseases
Health Care Treatment for Research Submissions: “All Treatments or NO specific treatment”

Disclosure: The study was supported by Janssen Global Services
200 Great Valley Pkwy.
Malvern, PA USA