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Appropriateness of Using Patient Data for Calculation of Reference Intervals for Complete Blood Count Parameters of Elderly Population

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Background: Calculation of reference intervals (RI) for the population served is a standard requirement to assure accurate interpretation of laboratory test results. Conventional method or direct method of calculation of RI for laboratory parameters for elderly population is practically not feasible. Literature recommends use of indirect method as an alternative. RI are not defined for complete blood count (CBC) parameters of elderly population in Sri Lanka.

Objectives: To assess the plausibility of using patient data to calculate RI of CBC parameters of elderly patients.

Methods: A retrospective, cross-sectional study was carried out using data of all the patients >65 years stored during two consecutive years in a hospital laboratory. Reports with flagging for any parameter, reports of inpatients and repeated samples and outliers in each parameter identified using Tukey's method were excluded. Distribution plots, Q-Q plots and box plots were drawn for all refined data and visually inspected for their normality of distribution. Since data were normally distributed, RI were defined as mean±2SD. Calculated RI were compared with RI provided by manufacturer of the automated CBC analyser and with RI defined in five other countries.

Results: There was a total of 3094 CBC reports of patients >65 years of age. Of those, only 1604 (51.8%) fulfilled the inclusion criteria. Distribution plots of data of all the parameters in both male and female groups showed normal distribution. Calculated RI of all CBC parameters were similar to those of other countries. RI obtained for red cell indices, platelet count and white blood cells were similar to the RI provided by the manufacturer for adults. RI obtained for red blood cell count, haemoglobin and packed cell volume were clinically significantly lower compared to the RI provided by the manufacturer for adults.

Conclusions: When appropriate selection criteria and appropriate statistical tools are applied, patient data can be used to calculate RI for CBC parameters in elderly people. Differences observed with manufacturer defined RI confirm the need for defining laboratory's own RI for the populations served.

Keywords: *Complete blood count, Indirect method, Older population, Patient data, Reference interval*