World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Modified Lot Quality Assurance Sampling (LQAS) Model for Quality Assessment of Malaria Parasite Microscopy and Rapid Diagnostic Tests in Kano, Nigeria

Authors : F. Sarkinfada, Dabo N. Tukur, Abbas A. Muaz, Adamu A. Yahuza

Abstract : Appropriate Quality Assurance (QA) of parasite-based diagnosis of malaria to justify Artemisinin-based Combination Therapy (ACT) is essential for Malaria Programmes. In Low and Middle Income Countries (LMIC), resource constrain appears to be a major challenge in implementing the conventional QA system. We designed and implemented a modified LQAS model for QA of malaria parasite (MP) microscopy and RDT in a State Specialist Hospital (SSH) and a University Health Clinic (UHC) in Kano, Nigeria. The capacities of both facilities for MP microscopy and RDT were assessed before implementing a modified LQAS over a period of 3 months. Quality indicators comprising the qualities of blood film and staining, MP positivity rates, concordance rates, error rates (in terms of false positives and false negatives), sensitivity and specificity were monitored and evaluated. Seventy one percent (71%) of the basic requirements for malaria microscopy was available in both facilities, with the absence of certifies microscopists, SOPs and Quality Assurance mechanisms. A daily average of 16 to 32 blood samples were tested with a blood film staining quality of >70% recorded in both facilities. Using microscopy, the MP positivity rates were 50.46% and 19.44% in SSH and UHS respectively, while the MP positivity rates were 45.83% and 22.78% in SSH and UHS when RDT was used. Higher concordance rates of 88.90% and 93.98% were recorded in SSH and UHC respectively using microscopy, while lower rates of 74.07% and 80.58% in SSH and UHC were recorded when RDT was used. In both facilities, error rates were higher when RDT was used than with microscopy. Sensitivity and specificity were higher when microscopy was used (95% and 84% in SSH; 94% in UHC) than when RDT was used (72% and 76% in SSH; 78% and 81% in UHC). It could be feasible to implement an integrated QA model for MP microscopy and RDT using modified LQAS in Malaria Control Programmes in Low and Middle Income Countries that might have resource constrain for parasite-base diagnosis of malaria to justify ACT treatment.

Keywords : malaria, microscopy, quality assurance, RDT
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020