

Diagnostic Performance of PCR and ELISA in the Detection of Hepatitis B Virus: A Sri Lankan Perspective

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Hepatitis B virus (HBV) remains a major public health concern globally. In Sri Lanka, access to reliable diagnostic tools is essential for effective disease management and control. This study aimed to compare the sensitivity, specificity, and diagnostic accuracy of two commonly used HBV detection methods; Polymerase Chain Reaction (PCR) and Enzyme-Linked Immunosorbent Assay (ELISA), within the Sri Lankan healthcare context. A retrospective analysis was conducted using HBV test records from a local healthcare facility. Data from both PCR and ELISA results were analysed. Sensitivity, specificity, and diagnostic accuracy were statistically compared using SPSS version 26.0. Additionally, operational parameters including turnaround time, cost, and technical requirements were assessed to evaluate the practical viability of each method in routine clinical practice. PCR demonstrated a higher sensitivity and specificity (99% each) compared to ELISA (85% sensitivity, 90% specificity). ELISA, however, was found to be more cost-effective and suitable for large-scale screening due to its lower cost (LKR 1,500 per test) and faster turnaround time (2-3 hours), compared to PCR (LKR 6,500 per test, 6-8 hours respectively). Both methods showed strengths and limitations in terms of technical expertise required and adaptability to resource-limited settings. PCR is superior in terms of diagnostic accuracy, making it ideal for confirmatory testing and early detection. ELISA remains a valuable tool for initial screening, particularly in high-throughput or resource-constrained environments. Integrating both methods strategically can enhance HBV diagnosis and management across diverse clinical settings in Sri Lanka.

Keywords: Diagnostic accuracy, enzyme-linked immunosorbent assay, polymerase chain reaction, Sri Lankan healthcare