

Human Polyomaviruses (HPyVs) in Saudi Arabia: Epidemiology, Oncogenic Potential, and Research Priorities

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ABSTRACT

Cancer remains a major global health burden, with nearly 20% of cases worldwide linked to infectious agents. Human polyomaviruses (HPyVs) are increasingly recognized for their diverse clinical outcomes, ranging from asymptomatic persistence to severe disease such as the case of Merkel cell polyomavirus (MCPyV) causing Merkel cell carcinomas (MCC). In Saudi Arabia, where several cancers of uncertain etiology are rising, the epidemiology and clinical relevance of HPyVs remain largely unknown. This review integrates global knowledge on HPyVs and provides the first comprehensive overview of their presence, clinical impact, and research gaps in Saudi Arabia. A narrative review was conducted using PubMed, Scopus, Web of Science, and Google Scholar through January 2025. Search terms targeted all known HPyVs, associated diseases, and Saudi Arabia; reference lists were screened for additional sources. Eleven peer-reviewed Saudi studies (2006–2025) reporting HPyV infections or Merkel cell carcinoma were included. MCPyV is the only HPyV with confirmed oncogenicity, driving most MCC. BKPv and JCPv are clinically important in transplant and immunosuppressed populations, though their cancer roles remain unproven. In Saudi Arabia, available evidence is limited to small studies on BKPv and case reports of JCPv related PML. No sero-epidemiologic surveys, viral sequencing, or tumor-based HPyV screening exist, and importantly, no MCPyV testing has been performed in Saudi Merkel cell carcinoma cases. HPyVs remain insufficiently investigated in Saudi Arabia despite their clinical relevance and potential oncogenic roles. Population-level serology, molecular characterization, and systematic tumor screening, especially for MCPyV in MCC are urgently needed to define their significance in the Saudi population.

Keywords: *Human polyomaviruses; MCPyV; BKPv; JCPv; Saudi Arabia; Merkel cell carcinoma; viral oncogenesis; epidemiology.*

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