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Current monkeypox outbreak: lessons from ancient history in Egyptian mummies?

Tracking the history and origin of an infectious disease can help to predict and better treat its modern descendants, according to paleopathology. Egyptian mummies are an ideal population in which to study the prevalence of infectious diseases in the ancient world.¹

Some of the most common organisms found in Egyptian mummies were *Schistosoma haematobium*, *Mycobacterium tuberculosis*, and variola virus.¹

The current global monkeypox outbreak has caused more than 16 000 cases in over 70 countries, and has been declared a public health emergency of international concern.² Monkeypox is caused by a DNA virus called monkeypox virus, belonging to the *Orthopoxvirus* genus which includes the variola virus, causing smallpox—hence the similarity between both viruses in terms of genetic structure, clinical presentation, and target vaccinations.³

During some analyses conducted by the US Centers for Disease Control and Prevention on Egyptian mummies, signs indicative of a poxvirus were found (eg, vesicular skin eruptions). However, the investigators were uncertain as to whether or not the

lesions were related to smallpox. Due to the similarity between both diseases, could they have been looking at monkeypox instead of smallpox? This remains a question worthy of answering, as no analyses have yet confirmed nor denied this plausible link.⁴

Tiee and colleagues examined 1000 museum specimens gathered in a 120-year period, revealing the presence of monkeypox virus in five African *Funisciurus* species as early as 1899. They proposed the presence of pox-like outbreaks in human and host animals before the first declared monkeypox case in 1958. They also highlighted the predominance of animal-to-human transmission of monkeypox virus, which represented 72–78.1% of all monkeypox cases in the 1980s.⁵ They linked the occurrence of these cases to wildlife; this further raises the question of whether the history of monkeypox virus goes back to ancient times, when wildlife was the dominant living environment for people such as the ancient Egyptians.

Infectious diseases (eg, cholera, measles, influenza, and smallpox) were very common among the ancient Egyptians, and they caused either death or immunity in affected individuals. Therefore, given the ancient habits of living in clusters of individuals, monkeypox virus could have been present among ancient Egyptians but in an asymptomatic form, which further complicates

linking monkeypox back to Egyptian history.¹

Analysis of historical specimens of Egyptian mummies thousands of years old will give us hints and insights about the history and evolution of monkeypox virus. It will also improve our ability to interpret and predict the impact of the recent different genetic mutations. These insights will help us manage not only the recent global monkeypox outbreak but also other modern viral infections.

We declare no competing interests.

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