



Brief Report

Screening for Monkeypox Infection in Asymptomatic High-Risk-Behaviour Men Having Sex with Men (MSM)

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Abstract: Background: Since the outbreak of monkeypox in formerly non-endemic countries, we have included a screening for monkeypox in our sexually transmitted diseases (STD) routine in patients with high-risk behavior, as it is mainly transmitted through close skin to mucous membrane contact with infected individuals. **Methods:** Between 16 June 2022 and 14 July 2022, we screened 53 MSM with high-risk behavior for monkeypox acquisition in an observational prospective cohort trial. We complemented the throat and anal swabs for chlamydia and gonococci with monkeypox using polymerase chain reaction (PCR). In addition, all patients participated in a questionnaire survey about their risk behavior and previous STD in their medical history. **Results:** None of the 53 participants had tested positive for the monkeypox virus. One patient was diagnosed with syphilis and one with an oral and anorectal chlamydia infection. **Conclusions:** STD screening in high-risk populations is a valuable tool to detect asymptomatic patients for chlamydia, gonococci, HIV, hepatitis B and C and syphilis. Based on our small cohort, monkeypox screening in asymptomatic MSM patients in areas of low prevalence does not seem to be an appropriate approach to deal with the ongoing outbreak. Therefore, we recommend to focus more on vaccinations, targeted nonstigmatizing information and behavior recommendation for risk populations, and to engage further investigations.

Keywords: monkeypox; screening; HIV; STD



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1. Introduction

Monkeypox is a viral zoonotic infection that was first reported as an outbreak in non-endemic countries in May 2022 with exclusively human-to-human transmission [1]. Since May 2022, 3188 cases have been reported in Germany as of 16 August 2022 [2]. Most cases have been identified in men who have sex with men (MSM) after close skin to mucous membrane contact of active lesions during sexual intercourse. Prodromal symptoms are systemic illness with fevers, myalgia and lymphadenopathy. Later on, patients develop characteristic lesions especially in the genital or oral region. In some cases, lesions appear without initial prodrome [3].

In our Infectious Disease Clinic at the University Medical Center Hamburg-Eppendorf, Germany, we see patients taking pre-exposition prophylaxis (PrEP) or postexposure prophylaxis (PEP) to prevent getting HIV, or people living with HIV, for a sexually transmitted diseases (STD) check. As monkeypox seems to be transmitted mainly by sexual contact [4], we included monkeypox screening in our regular STD check using anorectal and oropharyngeal swabs.

None of the patients showed a positive result for monkeypox. In our routine STD check, we detected and treated two (3.8%) sexual transmitted diseases. One patient was diagnosed with an oral and anal chlamydia infection and one patient had a positive serology test for syphilis. No patient tested positive for HIV or hepatitis C.

4. Discussion

Based on CDC recommendations [6], we know that screening patients with high-risk profiles is a powerful tool to detect sexually transmitted diseases. In this prospective study, the majority of the screened participants were PrEP or PEP users with a high number of sexual partners in the last 6 months. We perceive the study group as representative for the MSM population in Northern Germany, even though the incidence of STD was rather low, with 3.7% (2/53) in comparison to 20% in other study groups in Germany [7].

Since the outbreak of monkeypox in formerly non-endemic countries, we added a test for monkeypox in our STD routine. Human monkeypox is a zoonotic orthopoxvirus with presentation similar to smallpox. Sarkar et al. showed already in 1973 that smallpox can be detected in the upper respiratory tract of asymptomatic contacts [8]. During endemic monkeypox outbreaks in the previous years, asymptomatic cases were not investigated.

In this trial, none of the patients had an asymptomatic monkeypox infection. In comparison to our results, De Beetsel et al. found three asymptomatic patients with a PCR-positive anal swab for monkeypox in stored samples from 224 MSM in a retrospective trial in Belgium in June 2022 [9]. The results of De Beetsel et al. might lead to the conclusion that asymptomatic carriers could play a key role in virus transmission. Unfortunately, De Beetsel et al. could not confirm the monkeypox positivity of the asymptomatic cases in a second sample from different body parts or at a different time. As these findings come from a retrospective analysis, we cannot retrace if the included patients really were asymptomatic since there was no clinical examination. A recent prospective study from Paris, France, found 13 (6.5%) anorectal swabs being positive for the monkeypox virus in 200 asymptomatic men [10]. Only two of them developed symptoms in the follow-up. Whether the positive PCR results indicate viral replication and possible transmission is unknown. Further investigations are needed to address these uncertainties.

The significance of our analysis is limited since we evaluated only a small number of patients. In Hamburg, over 152 monkeypox cases have been documented until 15 August 2022, with the 4 weeks of our screening period showing the highest number of reported cases so far [11]. In Berlin, as an international hotspot with 1512 reported cases (16 August 2022) out of over 38,000 worldwide [12] the incidence is about 5 times higher. In our collective, none of the screened participants reported contact with a confirmed monkeypox case in the initial questioning.

Especially in international communities such as Berlin, awareness campaigns in health-care settings should focus on reliable information about signs and symptoms as well as behavior recommendations for risk populations. Providing targeted nonstigmatizing information to reduce the risk of transmission and identify, screen and examine contact persons could be an appropriate approach to treat the ongoing outbreak. In addition, based on the recommendation of the Standing Committee on Vaccination (STIKO) in Germany from 21 June 2022, targeted vaccination programs with the pox vaccine Imvanex/Jynneos as a postexposure prophylaxis (PEP), pre-exposure prophylaxis (PrEP) for persons with increased risk (MSM, frequent change of sexual partners) and personnel in specialized laboratories handling with infectious samples [13] should be established.

Based on our small cohort, monkeypox screening in asymptomatic MSM patients in areas of low prevalence does not seem to be a suitable tool to detect asymptomatic infections. Nevertheless, in high-prevalence settings this might still be reasonable to prevent further infections via asymptomatic individuals.

Author Contributions: Study design: J.P., H.M. and O.D.; supervision of study: O.D.; data acquisition: J.P., H.M., S.J., A.H., S.S. and O.D.; data analysis and validation: M.L., D.N., R.L.S., J.P. and O.D.; writing and editing of manuscript: J.P., H.M., S.S. and O.D. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are openly available.

Conflicts of Interest: O.D. has received honoraria and research funding from Gilead, Janssen, MSD and ViiV-Healthcare and participates in advisory boards for Gilead, Janssen, MSD, ViiV-Healthcare and Theratechnologies. J.P., H.M., S.S., A.H., S.J., R.L.S., M.L. and D.N. declared no conflict of interest.

References

1. CDC. European Centers of Disease Control Monkeypox Cases Reported in UK and Portugal. Available online: <https://www.ecdc.europa.eu/en/news-events/monkeypox-cases-reported-uk-and-portugal> (accessed on 19 May 2022).
2. RKI. Available online: <https://www.rki.de/DE/Content/InfAZ/A/Affenpocken/Ausbruch-2022-Situation-Deutschland.html> (accessed on 28 August 2022).
3. Minhaj, F.S.; Ogale, Y.P.; Whitehill, F.; Schultz, J.; Foote, M.; Davidson, W.; Hughes, C.M.; Wilkins, K.; Bachmann, L.; Chatelain, R.; et al. Monkeypox Outbreak—Nine States. *Morb. Mortal. Wkly. Rep. (MMWR)* **2022**, *71*, 764–769. [CrossRef] [PubMed]
4. Heskin, J.; Belfield, A.; Milne, C.; Brown, N.; Walters, Y.; Scott, C.; Bracchi, M.; Moore, L.S.P.; Mughal, N.; Rampling, T.; et al. Transmission of monkeypox virus through sexual contact—A novel route of infection. *J. Infect.* **2022**, *85*, 334–363. [CrossRef] [PubMed]
5. Nörz, D.; Tang, H.T.; Emmerich, P.; Giersch, K.; Fischer, N.; Addo, M.M.; Aepfelbacher, M.; Pfefferle, S.; Lütgehetmann, M. Rapid adaptation of established high-throughput molecular testing infrastructure for detection of monkeypox virus. *Emerg. Infect. Dis.* **2022**, *28*, 1765–1769. [CrossRef] [PubMed]
6. Workowski, K.A.; Bachmann, L.H.; Chan, P.A.; Johnston, C.M.; Muzny, C.A.; Park, I.; Reno, H.; Zenilman, J.M.; Bolan, G.A. Sexually Transmitted Infections Treatment Guidelines, 2021. *MMWR. Recomm. Rep.* **2021**, *70*, 1–187.
7. Koch-Institut, R. Abschlussbericht: Evaluation der Einführung der HIV-Präexpositionsprophylaxe als Leistung der Gesetzlichen Krankenversicherung (EvE-PrEP), Berlin 2022. Available online: https://www.rki.de/DE/Content/InfAZ/H/HIVAIDS/Abschlussbericht_EvE-PrEP.pdf?__blob=publicationFile (accessed on 29 September 2022).
8. Sarkar, J.K.; Mitra, A.C.; Mukherjee, M.K.; Se, S.K. Virus excretion in smallpox. *Bull World Health Organ* **1973**, *48*, 517–522.
9. De Baetselier, I.; Van Dijck, C.; Kenyon, C.; Coppens, J.; Van den Bossche, D.; Smet, H.; Vanroye, F.; Liesenborghs, L.; Ramadan, K.; Platteau, T.; et al. The Lancet. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4142074 (accessed on 21 June 2022).
10. Ferré, V.M.; Bachelard, A.; Zaidi, B.M.; Armand-Lefevre, L.; Descamps, D.; Charpentier, C.; Ghosn, J. Detection of Monkeypox Virus in Anorectal Swabs From Asymptomatic Men Who Have Sex with Men in a Sexually Transmitted Infection Screening Program in Paris, France. *Ann. Intern. Med.* **2022**. Online ahead of print. [CrossRef] [PubMed]
11. RKI. Available online: <https://survstat.rki.de/Content/Query/Create.aspx> (accessed on 28 August 2022).
12. CDC. European Centers of Disease Control 2022 Monkeypox Outbreak Global Map. Available online: <https://www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html> (accessed on 28 August 2022).
13. Impfkommision, S. Beschluss der STIKO für die Empfehlung zur Impfung gegen Affenpocken mit Imvanex (MVA-Impfstoff). *Epid. Bull.* **2022**, *25/26*, 3–4.