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Disorders of the Pleura

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IMPAIRED ANTIBODY RESPONSE TO MERKEL CELL POLYOMAVIRUS ANTIGENS IN PATIENTS AFFECTED BY PLEURAL MESOTHELIOMA AND WORKERS EXPOSED TO ASBESTOS

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PURPOSE: Pleural mesothelioma (PM) is a rare but aggressive tumor of the serosal cavities. Previous data suggest that alongside the inhalation of carcinogenic asbestos, other factors are involved in the PM onset, including oncogenic viruses. Merkel cell polyomavirus (MCPyV) is an ubiquitous small DNA tumor virus, which is the main cause of Merkel cell carcinoma. This skin tumor primarily arises in conditions of immune suppression/compromission. The MCPyV seroprevalence in PM patients and in workers ex-exposed to asbestos (WEAs) is unknown. We aimed to investigate the IgG antibody response to MCPyV antigens in sera from PM patients, WEA individuals and healthy subjects (HS).

METHODS: Herein, an indirect enzyme-linked immunosorbent assay (ELISA) method, with two peptides mimicking MCPyV viral protein 1 and 2 (VP1 and VP2) antigens, was used to investigate immunoglobulins G (IgGs) to MCPyV in sera from PM patients (n=108), WEA individuals (n=62) and HS (n=110). MCPyV seroprevalence and serological profiles were determined. To assess the humoral immune status of PMs and WEAs, the total serum IgGs were evaluated.

RESULTS: A lower rate of serum anti-MCPyV IgGs was detected in PM (29.6%) and WEA (29%) compared to HS (61%) ($p<0.001$). Serological profiles indicated lower optical densities (ODs) in PM and WEA compared to HS ($p<0.05$). The mean total IgG concentration resulted similar among PM, WEA and HS groups ($p>0.05$). Receiver-operating characteristic (ROC) curves indicated that MCPyV serology proved high sensitivity (77.2-91.2%) and specificity (77.8-93.5%) in distinguishing both PM and WEA from HS, with moderate J indexes (0.55-0.84); areas under the curves (AUCs) (0.85-0.98) were within the moderate/accurate reference range, and higher than that of a worthless test (0.5, $p<0.001$). WEAs with the highest asbestos exposure had the lower rate of serum anti-MCPyV IgGs (5.5%) compared to WEAs (45.5%) with the lower exposure. Serological profiles confirmed these data.

CONCLUSIONS: We provided the first evidence of the MCPyV serology in PM and WEA. Our data suggest that PMs and WEAs are experiencing a specific impairment of their immune response to MCPyV, which might rely to the immunomodulatory effect of asbestos, a well-known immunosuppressive mineral. Both PMs and WEAs may be predisposed to a reduced ability to present MCPyV antigens, thus resulting to a possible increase in viral activity. Verifying how and whether MCPyV plays a role in PM is a future area of study.

CLINICAL IMPLICATIONS: Evaluating the MCPyV serology may complement current follow-up analyses, thus giving additional information on exposed subjects who are at risk of developing asbestos-related tumors, such as PM.

DISCLOSURES:

No relevant relationships by Giada Badiale

No relevant relationships by Christian Felice Cervellera

No relevant relationships by Fernanda Martini

No relevant relationships by Chiara Mazziotta

No relevant relationships by John Charles Rotondo

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