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Studying the biological properties of pleural fluid: pleural fluid alone is adequate for cancer cell proliferation in vitro

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Article

Info & Metrics

Abstract

Malignant pleural effusion (MPE) is common in patients with malignant pleural mesothelioma (MPM) and with pleural metastases from other primary malignancies. There is early pre-clinical evidence of the potential biological properties of MPE fluid that may contribute to cancer cell proliferation.

Aim: to analyse the effects of pleural fluid on cancer cell cultures.

Method: Cells from established patient-derived MPM ($n=4$), breast carcinoma ($n=1$) and lung adenocarcinoma ($n=1$) cell cultures were seeded in 100% pleural fluid (exudate MPM MPE, transudate MPE, and non-MPE transudate fluid), with MPM cell line CRL-2081(MSTO-211H)TM as a control. Luminescence assays, serial live images, and calculation of percentage confluence (area covered by cells within serial images) were used to monitor cell proliferation. In addition, primary MPM cell culture was attempted using 100% MPE fluid as the cell culture medium, with primary MPM cell culture in standard full culture medium as a control.

Results: All established cancer cell cultures tested proliferated with similar growth rates in the different types of pleural fluid tested (exudate MPE, transudate MPE, transudate non-MPE fluid).

The success rate for primary MPM cell culture in MPE fluid was the same as for full culture medium: 3/6 (50%) success rates in both.

Conclusion: Pleural fluid alone is adequate for cancer cell proliferation *in vitro*. This supports the hypothesis that pleural fluid has important biological properties contributing to cancer cell growth, but the mechanisms are unclear and likely not malignant effusion specific.

Pleura Mesothelioma

Footnotes

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