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Editorial

Malignant Pleural Mesothelioma

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Malignant pleural mesothelioma (MPM) is an aggressive tumor arising from the mesothelial cells lining the pleura [1]. Though exposure to airborne asbestos fibers is considered as the main cause for MPM, the exact mechanism of mesothelioma development is unclear [2-4]. Considering the rare nature of MPM, it is not surprising that our understanding of MPM has lagged in comparison to other more prevalent types of cancer [5].

Surgery can be used for patients with early-stage disease. The goal of surgical resection is to achieve complete tumor removal but that is mostly unachievable due to a long latency period of ~40 years and detection at late stage [3,6].

Cisplatin, alone or in combination with Pemetrexed, administered as chemotherapy represents the standard treatment of mesothelioma patients who are not surgical candidates. However, MPM is largely unresponsive to conventional therapy and the minority of patients that initially respond to therapy eventually become resistant. Thus, resistance to chemotherapy, the lack of successful therapeutic agents and the aggressive nature of the tumour leads to short median survival times between 9-17 months [3,7-9].

One of the reasons for poor response of MPM to various treatment regimens is inter and intra-tumor heterogeneity [10]. Genetic profiling of MPM has unveiled frequent somatic mutation and copy-number alterations but they are found in relatively low frequency. Rare nature of MPM along with the low frequency of mutations as well as the existence of several tumor clones and subclones significantly limit the ability to formulate treatment strategies [6,10-12].

Biomarkers have been used as diagnostic and prognostic tools in many cancers [13]. In MPM number of different biomarkers have been evaluated but despite promising early results none of them can be recommended currently for routine clinical practice [11,14,15].

It has been suggested that surgery will lead to prolonged survival but that has not been supported by any clinical trials. Chemotherapy has a marginal effect on survival. Moreover, we have yet to establish an optimal strategy for diagnosis and treatment [3]. Because MPM is rare cancer, clinical development of new drugs is difficult making drug repositioning an attractive strategy [16].

Considering all the facts, well characterization of MPM using methodologies such as single-cell can help us to understand mesothelioma more precisely. This will eventually help us to develop novel strategies for early diagnosis and effective treatment. In addition, tactics such as drug repurposing and combination of conventional therapy with immunotherapy may open doors to a potential cure and mitigate challenge of MPM.

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