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Scientific Letter

Malignant Pleural Mesothelioma: Analysis of 70 Cases in the Last Decade

Mesotelioma pleural maligno: análisis de 70 casos en la última década

Dear Editor,

Malignant Pleural Mesothelioma (MPM) is an aggressive tumor linked to asbestos exposure, with a latency period of about 40 years before symptoms appear. Despite affecting a minority of exposed individuals, its risk escalates with prolonged exposure.[1] Originating from mesothelial cells, MPM affected 30,870 globally in 2020, causing 26,278 deaths. Early diagnosis remains challenging due to vague symptoms and latency. Survival rates vary, with better outcomes in early detection and specific subtype cases.

This study objectives are to describe the clinical, histological, radiological, staging, treatment and survival characteristics of all MPM diagnosed between January 2008 and December 2021 at Getafe University Hospital.

Quantitative variables are described by mean and standard deviation. Survival analysis is expressed by Kaplan–Meier method. Approval was obtained from the hospital's Ethics and Research Committee. Our sample consists of 70 patients diagnosed with MPM, of which 76% were males (53) with a mean age of 71 years (SD 8.3). The average annual incidence of MPM was 4.89 cases per 100,000 inhabitant.

Asbestos exposure was confirmed in 43 cases (61%) based on medical history. The immunohistochemical characteristics are reflected in Table 1. The most frequent symptoms at diagnosis were dyspnea 41 (59%), followed by chest pain 37 (53%), cough 26 (37%) and weight loss 16 (23%). The diagnostic methods used were thoracoscopy 41 (59%), image-guided pleural biopsy 11 (21%), thoracotomy 5 (17%), thoracentesis 3 (4%). The clinical staging obtained were: I 36 (50%), II 6 (9%), III 11 (16%) and IV 18 (25%).

Pleural effusion was evident in 60 patients (86%). The biochemical characteristics of pleural fluid showed an average pH of 7.34 (SD 0.09), glucose of 89.6 mg/dl (48.7), proteins of 4.59 (0.75) mg/ml, LDH of 604 (508) IU/L, and ADA of 46.7 (88.3) IU/L. The most frequent histological lines were epithelioid 52 (73%), mixed 10 (14%), sarcomatoid 8 (13%). The most frequently treatments received were chemotherapy treatment with carboplatin and pemetrexed in 51 (73%) patients, followed by palliative treatment 11 (16%) and surgical treatment 8 (11%) based on pleurectomy-decortication. Pleurodesis was performed in 21 (30%) patients. The overall median survival was 10 months. Patients who underwent surgical treatment showed a median survival of 17 months, followed by chemotherapy 10 months, and palliative care 3 months.

The study reveals a huge incidence of MPM in Getafe, Spain, attributed to historical asbestos exposure in local industries. Dyspnea and chest pain emerge as the most commonly reported symptoms, yet they lack specific diagnostic or prognostic value.[2] Pleural effusion prevalence is estimated to be around 75%, consistent with prior research conducted by Murphy DC et al.[3] Pleural fluid cytology is reliable but requires careful review. Thoracoscopy biopsy is the gold standard for MPM diagnosis. Recent European Society for Medical Oncology (ESMO) guidelines advise thoracoscopy for optimal diagnosis and staging, recommending pleuroscopy or VATS.[4] VATS pleural biopsies boast 95% sensitivity and 100% specificity, enabling simultaneous invasive procedures.[5]

A randomized trial comparing Abrams needle biopsy to CT-guided biopsy showed a yield of approximately 90% with the latter and 50% with Abrams method.[6] Recent studies investigated mesothelin as a blood biomarker for MPM, but it doesn't replace histological confirmation.[7]

The eighth TNM classification, effective since 2018, defines MPM's clinical stages, crucial for prognosis.[8] In our sample, 58.6% were in stages I–II, indicating pleural involvement without lymph node or distant metastasis.

According to data collected in 2020 by the SEER (Surveillance, Epidemiology, and End Results Program) of the National Cancer Institute of the USA where only 32% were early-stage, our area diagnoses about 60% of patients in early stages, aiding providing us with a better prognostic assessment and improved treatment planning. It is related to the annual radiological follow-up performed in our center in patients with occupational exposure to asbestos. Note that the presence of N2 lymph node involvement or M1 distant metastasis worsens survival.

Epithelioid variant of MPM has a better prognosis, especially if completely resected. In our study, 73% had this variant, recently seen as more of a continuum with sarcomatoid.[9]

Table 1
Immunohistochemical parameters of MPM based on histological subtype.

Histological subtype (*N* (%))	Calretinin (%)	Vimentin (%)	Cytokeratin (Cq)AE1/3 (%)	Cq5 (%)	Cq7 (%)	Epithelial membrane antigen (%)	Wilms tumor (%)	Desmin (%)
Sarcomatoid 8 (11%)	3 (4%)	5 (7%)	4 (6%)	0 (0%)	2 (3%)	2 (3%)	0 (0%)	0 (0%)
Epitheliod 53 (76%)	36 (51%)	23 (33%)	16 (23%)	14 (20%)	25 (36%)	7 (10%)	17 (24%)	1 (1%)
Mixed 9 (13%)	7 (10%)	8 (11%)	4 (6%)	2 (3%)	3 (4%)	1 (1%)	2 (3%)	0 (0%)

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Immunohistochemical panels, which typically include mesothelial and adenocarcinoma markers assist in diagnosis. However, their sensitivity for the sarcomatoid subtype is limited.[10] BAP1 nuclear expression loss, along with other markers, indicates malignancy.[11]

MPM treatment includes unimodal options like chemotherapy or palliative care and multimodal approaches combining medical and surgical treatments.

In patients unsuitable for surgery, systemic therapy, especially cisplatin combined with pemetrexed or raltitrexed, benefits patients with a performance status of 0–2, improving survival over cisplatin alone.

In our study, 61% received platinum and pemetrexed-based chemotherapy as first-line treatment, and 16% received palliative care, consistent with other series.[12] Multimodal treatment was pursued by only 11% of patients in our study, indicating a lower proportion compared to other reports. Surgical intervention, reserved for cases with complete tumor resection due to its risks, is part of the multimodal approach. Recently, MARS2 study is evaluating superiority role of extended pleurectomy-decortication plus chemotherapy versus chemotherapy alone.[13]

The MAPS trial found adding bevacizumab to cisplatin-pemetrexed in first-line MPM treatment improved overall survival without impacting quality of life, yet awaits regulatory approval. Other anti-angiogenic drugs or tyrosine kinase inhibitors didn't enhance survival in phase III trials.[14]

Nivolumab–ipilimumab in CheckMate 743 trial boosted overall survival in unresectable MPM, but didn't affect progression-free survival or response rates. Our study preceded these advancements, so our cases didn't receive immunotherapy.[15]

Survival rates at 1, 3, and 5 years from the Cancer Analysis System registry in England were 38%, 16%, and 8%, respectively, with a median survival of 8.3 months. Our data align with these findings. Sarcomatoid histology or advanced stages (N2 or M1) negatively impacted survival, with median survival of 12 months for epithelioid, 6 months for sarcomatoid, and 3 months for mixed subtypes.

As limitations include focusing on a single center and a specific population in south Madrid, potentially limiting generalizability due to its specificity in a high-incidence area. As a retrospective study, data collected from medical records might introduce biases and limit data quality control. Clinical recommendations may have changed since data collection, affecting their applicability.

In conclusion, our study reveals a high MPM incidence linked to asbestos exposure. Predominantly affecting older men, common symptoms include dyspnea and chest pain. Thoracoscopy and CT-guided biopsy were cost-effective diagnostic methods. Sarcomatoid and mixed varieties showed worse prognoses than epithelioid. More research and multicenter registries are needed for a better understanding of MPM.

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Authors' contributions

Fernando García: He has contributed to editing, research, and image processing.

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Conflicts of interest

None.

The authors declare to have no conflict of interest directly or indirectly related to the manuscript contents.

Declare that I have used tools such as Google Translate and ChatGPT in the English translation of this document.

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