Peritoneal malignant mesothelioma: case report

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SUMMARY: Peritoneal malignant mesothelioma: case report.

Our study reports peritoneal diffuse malignant mesothelioma (DMM) in a 43 years old male patient, with no exposure to the asbestos in his medical history; the partner of patient was also not exposed to asbestos. The exposure to X-rays was also excluded.

Different pathogenic mechanisms for the pathogenesis of a peritoneal diffuse malignant mesothelioma in this patient can be hypothesized, for example, SV40 infection and genetic susceptibility, a minimal domestic exposure to asbestos can be not excluded. Therefore, further studies in a more large number of subjects are necessary to determine whether one or all of these hypothetic pathogenic mechanisms are more significant for the develop of malignant mesothelioma.

KEY WORDS: Asbestos - Peritoneal mesothelioma.

RIASSUNTO: Mesotelioma maligno del peritoneo: caso clinico.

Viene riportato un caso di mesotelioma peritoneale diffuso maligno in soggetto di sesso maschile, di anni 43, con anamnesi negativa per pregressa esposizione ad asbesto, né occupazionale diretta né indiretta, quale ad esempio la convivenza con partner esposto, né ambientale. È stata inoltre esclusa esposizione a radiazioni ionizzanti.

Anche se non è possibile escludere un eventuale responsabilità del virus SV40, appare ragionevole ritenere che una eventuale minima esposizione ad asbesto nell’ambiente domestico e la concomitante susceptibility genetica possano aver determinato l’instaurarsi della malattia. Pertanto ulteriori studi su larga scala sono necessari per determinare quali tra i possibili meccanismi patogenetici siano davvero responsabili dell’insorgenza di un mesotelioma maligno.

KEY WORDS: Asbesto - Mesotelioma peritoneale.

Introduction

The mesothelioma is a rare malignancy that has origin from pleura (95.5%) or peritoneum (4%); more rarely it can be localized in the pericardium or in the vaginal tunica of the testicle (1). In the USA there’s an incidence of about 2,500 cases/year (2).

The diagnosis is often difficult both for clinical features, due to the necessity of a differential diagnosis of a primitive neoplasia from metastasis, and for a morphological features, because the mesothelial malignancies can be epithelial-like (tubular-papillous, non-glandular, solid), sarcomatous-like, undifferentiated or mixed forms (3-4). About the 50% of the mesothelial malignancies are epithelial-like forms, while the 25% and the 15% are respectively mixed and sarcomatous-like forms (5). The other cases are undifferentiated or specific subtypes. These subtypes are represented by desmoplastic, lymphohistiocytoid, small cells, and decidual forms (3). The tubular-papillous type of the epithelial forms have better prognosis than the sarcomatous form (6).

Diffuse pleural and peritoneal mesotheliomas, have many common characteristics, especially the histopathology and the immunophenotype (7). The clinical features and the treatment are different and depend on the localization of the neoplasia. The peritoneal tumour takes origin from the serosa and is characterized by peritoneal dissemination and presence of ascites;
when there's invasion of the bowel, the untreatable ascites determines the death. Usually, these neoplasias are confined into the abdominal cavity and they rarely invade the liver. In the advanced stages there can be pleural invasion and metastatization (8). A study based on the natural history of this pathology showed the 2/3 of the patients had only intrabdominal neoplasia, and the 78% of them died for intrabdominal disease progression (9).

The prognosis is very poor, with a survival range that approximately amount from 7 to 13 months (10). Diffused malignant mesothelioma is usually treated with palliative surgery, in order to resolve intestinal obstruction or massive ascites, radiotherapy, chemotherapy, but no therapy is really useful. Recently some clinical trials demonstrated that a multimodal therapy combining debulking surgery with peritoneectomy and hypertermic peritoneal perfusion increased the survival in selected patients (10).

Currently, the asbestos is considered the more important aetiological factor of the pleural and peritoneal mesothelioma. Between several types of asbestos, the crocidolite (the blue asbestos) and the amosite (the tawny asbestos) are much more powerful of chrysotile (the white asbestos) in causing this neoplasia. The greater carcinogenicity of two amphibole asbestos versus the asbestos of serpentine has been explained because rectilinear amphibolyc fibres easier take lymphatic way and go into the pleural tissue than fibres of serpentine which are characterized by longitudinal or axial curves. In particular, the peritoneal mesothelioma seems to be correlated to the exposure to the crocidolite (11). As for what is happening in Europe and in various countries as the Great Britain (12), in Italy there's a great increase of this disease related to a wide spread of the asbestos especially in the 50's and 60's.

From 1988 to 1992 the total number of the deaths for pleural and peritoneal mesothelioma in Italy has been 2700 in the male population and 1519 in female (approximately 2:1) (13).

In the casuistry of the COR (Centro Operativo Regionale) in Puglia (Italy) from 1980 to 1997, it has been noticed that the sure exposures to asbestos correspond to 36.8% of the cases of mesothelial malignancies, the probable ones to 0.9%, the possible ones to 24.5%, the indirect ones to 5.9%; at last in 15% of the cases there is no document of any exposures (14). According to recent studies the percentage of mesothelioma in absence of exposure to asbestos is equal or inferior to 1 or 2 cases/year for every million persons (15, 16).

Therefore we consider interesting our case of peritoneal mesothelioma in a young man for whom no exposure to asbestos could be evidenced.

Case report

A 43 years old man was admitted to hospital on August 2006 with a quite subcontinous pain, firstly localized in the right hypochondrium, but recently diffuse to whole abdomen, with fever (about 37°C), irregular alvus and abdominal meteorism. He suffered from asthenia and inappetence. Moreover, he referred a loss of weight of about 8 kg in the last 3 months. He had a medical history characterized by an appendectomy and a varicocelectomy.

The ultrasonography showed hepatic steatosis and a hypoechogenic mass of about 4 cm of diameter under the inferior pole of the spleen. A CT scan showed a hypo-dense, polilobated, solid mass with a cranium-caudal extension of about 7.5 cm, adjacent to the tail of the pancreas; no presence of lymphadenomegaly.

On admission he underwent to routinely serologic examinations and to an abdominal MR. That confirmed the data reported in the previous CT scan. Therefore, we decided to perform a surgical procedure.

Through a bilateral subcostal incision, we found a diffuse peritoneal carcinosis and a large neoplastic mass growth from the spleen to the lower abdominal quadrants. The frozen sections showed neoplastic cells of an adenocarcinoma. Therefore we re-nounced radical surgery.

The patient was discharged in 6th day after a regular postoperative course. The definitive histological examination showed an epithelial-like tumour with partially solid and papillary structures and other free neoplastic elements in the ascites. The morphologic and immunophenotypical reports were compatible with the diagnosis of a peritoneal malignant mesothelioma.

Discussion

Many epidemiological studies have well documented the relationship between exposure to asbestos and mesothelioma (17). Malignant mesothelioma is considered a “target” neoplasia of exposure to asbestos (18), even if, in spite of the association with past exposure, only someone of people develops the disease after exposure. Asbestos is considered the most important aetiological factor for this neoplasia, but cases of pleural mesothelioma have been observed in apparently not exposed subjects (19-20), maybe due to the misunderstanding of the exposure, that sometimes can pass unnoticed both to the patient than to the doctor. It is important to consider that for the mesothelioma onset, low and very low doses of asbestos too have pathogenic potentiality, as described by Selikoff in 1978 (The triggering dose can be small, in sure cases extraordinarily small.) (21).

Recent medical publications assert that “all the available informations indicate that mesothelioma, with this characteristic of independence from the amounting inhaled asbestos, differs not only from the other diseases provoked from the asbestos (asbestosis and pulmonary cancer) but also from all the other tumours from cause or concomitant cause, professional or not (chromium, from hydrocarbons,
Many scientific studies assert that in the genesis of this tumour, some individual characteristics are more important than others to make some subjects much more receptive than others to the carcinogenic action of the asbestos on the pleura and peritoneum (22). The individual susceptibility seems to have a primary role in the pleural genesis of malignant mesothelioma (23). Therefore the case we described could be explained by this pathogenic hypothesis. Exposing sources are present everywhere, like the indoor and outdoor pollution, especially from brakes and clutches of the older cars, and the building materials used until the 70’s. It is also important the inner pollution of public buildings, due to the asbestos fibre released in the building materials for its antifire and insulating qualities. Such materials have been used for the isolation especially in schools, hospitals, theatres, cinemas, in the conditioning systems, ships. In domestic atmosphere there can be present objects containing asbestos as old gas heater, some domestic appliances, insulators placed behind heaters in kitchen, gloves, etc. There are also the pollution of the hinterland industrial areas where is a great use of the asbestos, the not controlled dispersion from rubbish dumps, natural or produced pollution from industrial or mining drainages, demolitions and removals of materials containing asbestos, erosion of roofs, sheds, etc., or release from the ducts in concrete asbestos in the drinkable water. The pollution of life atmosphere, even if less than that in job atmospheres, can represent an important problem for the human health related to the high number of persons who can be exposed and to the timing of the exposure. They have been estimated in 0,2-3,7 for 100,000 the number of the deaths for pulmonary tumour and mesothelioma due to one exposure to 0,001 asbestos fibres for millilitre (1 air/l fibre) inhaled in scholar age beginning from 10 years old in scholastic atmosphere for 5 years using as medium age of life 75 years. Generally the atmosphere pollution is three-fold smaller of the limit established in job atmospheres, but even if the level appears low, however that does not mean that it can be ignored.

We must remember that even the WHO has recognized the impossibility to characterize a threshold value of asbestos fibre concentration in the air under which there isn’t any risk. There have been alarms of the ultrafine fibre presence in the lung of subjects only exposed to the pollution of life’s atmosphere (24).

The exposure to radiations, a risk factor for pleural mesothelioma (25), is not to be considered as a possible aetiological agent because our patient has not had any treatment like this. For what concern radiations, we have found in literature many cases of mesothelioma in patients who had been subordinate to radiating therapy for neoplasias, but a recent study made by Neugut et others (26) on 250,000 patients with breast cancer and Hodgkin’s disease, 255 of which had been subordinate to radiotherapy, has shown a relative risk to develop mesothelioma after thoracic radiotherapy of 1.6 with a IC to 95% of 0.2-5.6 not statistically significant. Without radiating therapy the relative risk has turned out of 0,9% (0.2-2.2). This excludes a relation between irradiation of the chest and mesothelioma.

For what concern alimentary habits, other risk factor for mesothelioma, our patient used Mediterranean diet and he did not have any preferences for foods like tomatoes, carrots, broccoli and spinach (27). In literature the risk of development of mesothelioma due to a particular type of diet remains uncertain.

It is not possible to exclude an eventual contamination from virus SV40, that empowers the carcinogenic action of asbestos (28). This agent would carry out its action not by the integration in the DNA of the mesothelial cells, but with an episomal mechanism. Such observations take origin from the fact that studies has demonstrated that the intrapleural injection of SV40 is capable to induce a malignant mesothelioma in the 100% of animals from experiment independently from the exposure to the asbestos (29).

The statistical data, available today, are contrasting and they do not permit conclusions, probably because no study has never had a sufficiently long follow-up to evidence malignancies characterized from long latent periods; no case control study finished (30). The remarkable contribution of biomolecular data suggests the possibility of a aetopathogenic association between SV40 and asbestos in malignant mesothelioma.

In conclusion, the case we reported of a peritoneal mesothelioma without evident exposure to asbestos, places not few problems as regards the possible aetiological relation. In the absence of other risk factors like exposure to radiations, contamination from SV40 and particular diet, it appears quite reasonable to think that the eventual minimal exposure to asbestos in domestic atmosphere and the concomitant genetic susceptibility can be responsible of the disease.

This case, like others described in literature (31), make other studies necessary, in order to improve the knowledge of the relationship between the natural and unnatural causes in development of the neoplasia.
References


