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Mesothelioma, a rare tumor and its management in 2023

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Introduction

Mesothelioma is a rare and aggressive type of cancer that typically affects the lining of the lungs, but can also affect the lining of the abdomen, heart, or testicles. Unfortunately, mesothelioma is often diagnosed in the late stages, making it difficult to treat.[1]

Overview

There have been some recent advances in both the diagnostic and therapeutic approaches for mesothelioma. Here are some of the key developments.

Early detection

Early detection is crucial in improving the chances of successful treatment. Recent studies have shown that blood tests, such as the MESOMARK assay, can help detect mesothelioma in its early stages. Other diagnostic tests, such as CT scans and biopsies, are also used to diagnose mesothelioma.

The MESOMARK test is a blood test that detects specific markers in the blood associated with mesothelioma. The test is based on the detection of soluble mesothelin-related peptides (SMRPs), which are shed into the blood by mesothelioma cells.

SMRPs are a type of protein that is produced by mesothelioma cells and are not typically found in healthy individuals. The MESOMARK test measures the levels of SMRPs in the blood, and elevated levels of SMRPs are indicative of mesothelioma.

The MESOMARK test is performed by drawing a blood sample from the patient, which is then sent to a laboratory for analysis. The laboratory uses an enzyme-linked immunosorbent assay (ELISA) to detect the levels of SMRPs in the blood. The ELISA test uses antibodies that specifically bind to SMRPs, allowing for the detection and measurement of SMRPs in the blood sample.[2]

The MESOMARK test is not 100% accurate and can produce false-positive and false-negative results. However, the MESOMARK test is a useful tool in the diagnosis of mesothelioma, especially in cases where other diagnostic tests, such as CT scans and biopsies, are inconclusive or cannot be performed.

It's important to note that the MESOMARK test is not a screening test for mesothelioma, and it should not be used as a substitute for regular medical checkups and cancer screenings. The test is only intended for use in patients who have already been diagnosed with mesothelioma or who are suspected of having mesothelioma. If you have concerns about mesothelioma or have been exposed to asbestos, it's important to talk to your healthcare provider about your risk and the appropriate screening and diagnostic tests.

Immunotherapy

Immunotherapy is a type of cancer treatment that uses the body's immune system to fight cancer cells. Recent clinical trials have shown that immunotherapy drugs, such as pembrolizumab and nivolumab, can be effective in treating mesothelioma.

Targeted therapy

Targeted therapy is a type of cancer treatment that targets specific genes or proteins that are involved in the growth and spread of cancer cells. Recent studies have identified specific genetic mutations in mesothelioma cells that could be targeted with drugs, such as erlotinib and crizotinib.

Surgery

Surgery is often used to remove as much of the mesothelioma as possible. Recent advances in surgical techniques, such as video-assisted thoracoscopic surgery (VATS), have made surgery less invasive and improved outcomes.

Radiation therapy

Radiation therapy uses high-energy radiation to kill cancer cells. Recent advances in radiation therapy, such as intensity-modulated radiation therapy (IMRT) and stereotactic body radiation therapy (SBRT), have improved the precision of radiation therapy and reduced side effects.

Overall, while mesothelioma remains a challenging cancer to treat, advances in diagnostic and therapeutic approaches offer hope for improved outcomes in the future. It's important for individuals who have been exposed to asbestos to undergo regular medical screenings to detect mesothelioma as early as possible.[3]

Incidence of mesothelioma in the world and in Argentina

Mesothelioma is a relatively rare form of cancer, but its incidence can vary widely depending on factors such as age, gender, and geography. Here are some statistics on the incidence of mesothelioma in the world and in Argentina:

Worldwide

1) According to the World Health Organization (WHO), an estimated 43,000 people die each year from mesothelioma worldwide.

2) Mesothelioma is most common in industrialized countries, particularly those with a history of heavy asbestos use.[4]

Argentina

1) According to data from the Argentine Ministry of Health, there were 355 deaths from mesothelioma in Argentina in 2019.

2) The incidence of mesothelioma in Argentina is thought to be relatively low compared to other countries, likely due to the fact that asbestos use in the country has been limited in recent years.

It's important to note that mesothelioma is a challenging disease to diagnose and treat, and accurate statistics on its incidence can be difficult to obtain. If you or a loved one has been diagnosed with mesothelioma, it's important to talk to your healthcare provider about your individual situation and treatment options.

Mesothelioma and asbestos

Asbestos is a naturally occurring mineral that was widely used in construction and manufacturing for many years due to its heat-resistant properties. However, exposure to asbestos has been linked to the development of several serious health conditions, including mesothelioma.

When asbestos fibers are inhaled or ingested, they can become trapped in the body, causing inflammation and scarring of the lung tissue. Over time, this can lead to the development of mesothelioma or other asbestos-related diseases.

While exposure to asbestos is the primary risk factor for developing mesothelioma, not everyone who is exposed to asbestos will develop the disease. Other factors, such as genetic predisposition, smoking, and other environmental factors, may also play a role in the development of mesothelioma.

It's important to note that asbestos has been largely phased out of use in many countries due to its health risks. However, it is still present in many older buildings and products, and workers in certain industries may still be at risk of exposure. If you think you may have been exposed to asbestos, it's important to talk to your healthcare provider about your risk and potential screening options.[4]

Signs and symptoms

Mesothelioma is a type of cancer that can develop in the lining of the lungs, abdomen, or heart. The signs and symptoms of mesothelioma can vary depending on the location of the tumor and the stage of the disease. Here are some of the common signs and symptoms of mesothelioma:

Chest pain

Chest pain is a common symptom of pleural mesothelioma, which affects the lining of the lungs. The pain may be sharp and constant, and it may worsen with deep breathing or coughing.

Shortness of breath

Shortness of breath is another common symptom of pleural mesothelioma. This can be due to the buildup of fluid in the pleural space, which can compress the lungs and make it difficult to breathe.

Fatigue

Fatigue is a common symptom of mesothelioma, and it can be caused by the cancer itself, as well as the treatments used to treat it.

Weight loss

Unexplained weight loss can be a sign of mesothelioma or other types of cancer. In mesothelioma, weight loss may be due to a loss of appetite or the cancer's effect on the body's metabolism.

Abdominal pain

Abdominal pain is a common symptom of peritoneal mesothelioma, which affects the lining of the abdomen. The pain may be constant or intermittent and may be accompanied by bloating or swelling.

Bowel changes

Changes in bowel habits, such as diarrhea or constipation, can be a symptom of peritoneal mesothelioma.

Anemia

Anemia, or a low red blood cell count, is a common symptom of mesothelioma. This can be due to the cancer's effect on the body's production of red blood cells, as well as the side effects of treatment.[5,6,7]

It's important to note that these symptoms can be caused by other conditions, and they do not necessarily mean that a person has mesothelioma. If you are experiencing any of these symptoms, it's important to talk to your healthcare provider to determine the underlying cause and the appropriate course of treatment.

Staging

The staging of mesothelioma is a way of describing the extent and spread of the cancer in the body. The staging system for mesothelioma is different for each type of mesothelioma and is based on the size and location of the tumor, as well as the presence of metastasis (spread of cancer to other parts of the body). Here are the stages of mesothelioma for each type:

Pleural mesothelioma staging

1) Stage 1: The cancer is confined to the lining of the lungs and has not spread to nearby lymph nodes.

2) Stage 2: The cancer has spread to nearby lymph nodes, but has not spread to other parts of the body.

3) Stage 3: The cancer has spread to nearby organs and tissues, such as the chest wall or diaphragm, and may have spread to lymph nodes in the chest.

4) Stage 4: The cancer has spread to other parts of the body, such as the liver, bones, or brain.

Peritoneal mesothelioma staging

1) Stage 1: The cancer is confined to the lining of the abdomen and has not spread to nearby lymph nodes.

2) Stage 2: The cancer has spread to nearby lymph nodes, but has not spread to other parts of the body.

3) Stage 3: The cancer has spread to nearby organs and tissues, such as the liver or spleen, and may have spread to lymph nodes in the abdomen.

4) Stage 4: The cancer has spread to other parts of the body, such as the lungs, bones, or brain.

Pericardial mesothelioma staging

Pericardial mesothelioma is rare, and there is no standard staging system for this type of cancer. However, doctors may use a staging system similar to that used for pleural mesothelioma.

It's important to note that the staging of mesothelioma is complex and can vary depending on a number of factors. Treatment and prognosis can also vary depending on the stage of the cancer, as well as other individual factors such as age, overall health, and the patient's response to treatment. If you have been diagnosed with mesothelioma, it's important to talk to your healthcare provider about the specific stage of your cancer and the most appropriate course of treatment for your individual needs.[8,9]

Prognosis

The prognosis for mesothelioma depends on several factors, including the stage and type of cancer, the patient's overall health and age, and how well the cancer responds to treatment. Unfortunately, mesothelioma is often diagnosed at an advanced stage, which can make it more difficult to treat and lower the chances of a cure. However, treatment can still help manage the cancer and improve quality of life.

In general, the prognosis for mesothelioma is often poor, with a 5-year survival rate of around 10-15% for most cases. However, some patients may have a better prognosis if the cancer is diagnosed early and treated aggressively. The prognosis is also better for patients with epithelioid mesothelioma, which is a less aggressive form of the cancer.

It's important to note that there is no known cure for mesothelioma. However, there are several treatment options that can help manage the cancer and improve quality of life. These may include surgery, chemotherapy, radiation therapy, immunotherapy, and targeted therapy. Treatment may be used to shrink the tumor, alleviate symptoms, or slow the progression of the cancer. In some cases, treatment may even lead to remission or long-term disease control.[10,11]

If you or a loved one has been diagnosed with mesothelioma, it's important to talk to your healthcare provider about your specific prognosis and treatment options. They can help you understand your individual situation and develop a personalized treatment plan to manage your cancer and improve your quality of life.

Treatment options

The best treatment options for mesothelioma depend on the stage of the disease and the individual patient's circumstances. Here are some of the current treatment options for mesothelioma with curative intent and for advanced cases:

Surgery

Surgery is the most common treatment option for mesothelioma with curative intent. The goal of surgery is to remove as much of the cancer as possible. Surgical options for mesothelioma include pleurectomy/decortication (P/D) and extra pleural pneumonectomy (EPP).

Chemotherapy

Chemotherapy is often used in combination with surgery for mesothelioma to help kill any remaining cancer cells. Chemotherapy drugs that are commonly used for mesothelioma include cisplatin and pemetrexed.

Radiation therapy

Radiation therapy can be used before or after surgery to help kill cancer cells and shrink tumors.

Advanced treatment options

Palliative surgery

Palliative surgery may be an option for advanced mesothelioma to help relieve symptoms such as pain and difficulty breathing.

Chemotherapy

Chemotherapy is also used in advanced mesothelioma to help slow the growth of the cancer and relieve symptoms.

Immunotherapy

Immunotherapy is a newer treatment option for mesothelioma that works by boosting the immune system's ability to fight cancer cells. Drugs used for immunotherapy in mesothelioma include pembrolizumab and nivolumab.

Targeted therapy

Targeted therapy is a type of treatment that works by targeting specific genes or proteins in cancer cells. Drugs used for targeted therapy in mesothelioma include bevacizumab and crizotinib.

It's important to note that there is no one "best" treatment for mesothelioma, and treatment decisions should be made on a case-by-case basis. Your healthcare provider can help determine the best treatment options for your individual situation.[12,13]

Conclusion and future

Mesothelioma is a rare and aggressive form of cancer that is difficult to diagnose and treat. However, there is ongoing research aimed at improving our understanding of the disease and developing new treatments to improve outcomes for patients. Here are some of the areas of research that are currently being explored:

Early detection

One of the biggest challenges in treating mesothelioma is diagnosing it early, when it is more likely to be treatable. Researchers are working on developing new biomarkers and imaging techniques that can help detect mesothelioma earlier and with greater accuracy.

New treatments

There are several new treatments being explored for mesothelioma, including immunotherapy, targeted therapy, and gene therapy. These treatments may be used alone or in combination with other therapies to improve outcomes for patients.

Biomarkers

Biomarkers are proteins or other molecules in the body that can be used to detect and monitor disease. Researchers are exploring new biomarkers for mesothelioma that could help with diagnosis, treatment monitoring, and predicting outcomes.

Personalized medicine

Personalized medicine involves tailoring treatments to a patient's specific genetic makeup or other individual characteristics. Researchers are exploring the potential of personalized medicine in mesothelioma to develop more effective and targeted treatments.

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Clinical trials

Clinical trials are an important way to test new treatments and therapies for mesothelioma. There are many ongoing clinical trials for mesothelioma, and patients may be eligible to participate in these trials to access new treatments and help advance research.

Overall, the future of mesothelioma research is promising, with many new advances and discoveries on the horizon. While mesothelioma is a challenging disease, ongoing research offers hope for improved outcomes and better quality of life for patients in the future.[14,15]

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Conflicts of interest

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References

1. Marcq E, Van Audenaerde JR, De Waele J, et al. Building a Bridge between Chemotherapy and Immunotherapy in Malignant Pleural Mesothelioma: Investigating the Effect of Chemotherapy on Immune Checkpoint Ex-pression. *Int J Mol Sci*. 2019;20(17):4182.
2. Brims F. Epidemiology and Clinical Aspects of Malignant Pleural Mesothelioma. *Cancers*. 2021;13(16):4194.
3. WHO Global Mesothelioma Deaths Reported to the World Health Organization between 1994 and 2008. 2020.
4. Boffetta P, Donato F, Pira E, et al. Risk of mesothelioma after cessation of asbestos exposure: A systematic review and meta-regression. *Int Arch Occup Environ Health*. 2019;92(7):949–957.
5. Sekido Y. Molecular pathogenesis of malignant mesothelioma. *Carcinogenesis*. 2013;34(7):1413–1419.
6. Kobayashi N, Toyooka S, Yanai H, et al. Frequent p16 inactivation by homozygous deletion or methylation is associated with a poor prognosis in Japanese patients with pleural mesothelioma. *Lung Cancer*. 2008;62(1):120–125.
7. Asciak R, George V, Rahman NM. Update on biology and management of mesothelioma. *Eur Respir Rev*. 2021;30(159):200226.
8. Berzenji L, Van Schil PE, Carp L. The eighth TNM classification for malignant pleural mesothelioma. *Transl Lung Cancer Res*. 2018;7(5):543–549.
9. Beasley MB, Galateau Salle F, Dacic S. Pleural mesothelioma classification update. *Virchows Arch*. 2021;478(1):59–72.
10. Borrelli EP, McGladrigan CG. A Review of Pharmacologic Management in the Treatment of Mesothelioma. *Curr Treat Options Oncol*. 2021;22(2):14.
11. Baas P, Fennell D, Kerr KM, et al. Malignant pleural mesothelioma: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2015;26(Suppl 5):v31–v39.
12. National Comprehensive Cancer Network Malignant Pleural Mesothelioma. 2021.
13. Van Schil PE, Baas P, Gaafar R, et al. Trimodality therapy for malignant pleural mesothelioma: Results from an EORTC phase II multicentre trial. *Eur Respir J*. 2010;36(6):1362–1369.
14. Quispel Janssen J, van der Noort V, De Vries JF, et al. Programmed Death 1 Blockade With Nivolumab in Patients With Recurrent Malignant Pleural Mesothelioma. *J Thorac Oncol*. 2018;13(10):1569–1576.
15. Hyde Barrett L. First New Drug Treatment for Mesothelioma Approved by FDA in Over 16 Years. 2020.