Multiple myeloma

Published by the International Myeloma Foundation (UK) May 2001

Bone marrow cancer...

...an introduction

Design: **The Almond Consultancy,** Edinburgh, UK.

UK Myeloma Awareness Week
21-28 June

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What is Myeloma?

Multiple Myeloma is a relatively rare cancer of the plasma cells. Plasma cells are found in the bone marrow and are responsible for protecting the body against viruses and infections. In Myeloma, a single defective plasma cell (a Myeloma cell) multiplies rapidly, disrupting the immune system and displacing the healthy bone marrow. The Myeloma cells can also collect in a single location forming a plasmacytoma (tumour).

What causes Myeloma?

The causes of Myeloma are generally unknown but the following risk factors have been identified:

- radiation (atomic bombs and testing, nuclear workers and heavy "loads" of x-rays)
- industrial or occupational factors (petroleum, asbestos, benzene, pesticides, solvents)
- recurrent infections and drug allergies

Signs and Symptoms

There are four main groups of symptoms that can occur:

Bone Pain

Bone pain is experienced because the Myeloma cells produce cytokines which attack and destroy bone. This is most common in the lower back, hips and ribcage. The pain is often described as dull and aching and is usually made worse by movement.

Fatigue/Anaemia

The rapidly reproducing Myeloma cells in the bone marrow impair normal bone marrow function, therefore not enough normal blood cells are being produced. This leads to anaemia (lack of red blood cells to carry oxygen around the body) which may cause fatigue, weakness and breathlessness.

Infections

Normally proteins in the blood fight off infection. In Myeloma these proteins become abnormal and the patient has reduced immunity so they become predisposed to infection. Pneumonia, bladder or kidney infection, sinusitis and skin infections are particularly common.

Hypercalcaemia
(increased calcium in the blood)

When areas of bone are destroyed by the cytokines calcium is released into the blood. Symptoms such as thirst, nausea, constipation and mental confusion occur and can steadily worsen until blood calcium levels are brought under control.

Diagnosis

Tests are carried out and the following results are required to confirm the Myeloma:

- A bone marrow sample containing more than 10% but usually more than 30% Myeloma cells.
- A biopsy from a plasmacytoma typically containing 90-100% Myeloma cells.

- Blood and urine tests showing high levels of Myeloma cells.
- X-rays and bone scans showing areas of bone damage caused by the Myeloma.

Treatment

Treatment is aimed at destroying the Myeloma cells and relieving symptoms:

Chemotherapy

Through the administration of anti-cancer drugs chemotherapy aims to destroy the Myeloma cells. The drugs are given in cycles, either by injection or orally, over a period of months, with spaces in between to allow the immune system and normal marrow cells to recover. There are many different chemotherapy options involving different combinations and dosages of drugs. Some side effects are usually seen including hair loss, nausea, infections, mouth sores and ulcers. Less commonly abdominal cramps, constipation, numbness and tingling in the hands and feet are seen, and sometimes fertility can be affected. These side effects vary between patients and often depend on which chemotherapy drug is being used.

Radiotherapy

A localised area where there is bone destruction and pain is exposed to controlled doses of radiation. It is also used to sterilise an area where a plasmacytoma has been surgically removed. Radiotherapy achieves quick pain relief and controls bone destruction. It can be used on its own or in conjunction with chemotherapy and is usually given five times a week over a period of weeks or months.

Transplantation

Transplants are being evaluated as alternatives to conventional treatment and as potential cures, however no type of transplant has proven to be curative yet. Typically transplantation involves extremely high dose chemotherapy (to destroy all of the patient's bone marrow), sometimes combined with total body radiotherapy, followed by the transplant itself (to replace the destroyed bone marrow). Bone marrow or stem cells (the cells which grow into bone marrow) can be transplanted, either from a genetically matched donor (allogeneic transplant) or the patient's own healthy cells

can be removed earlier and then returned to them (autologous transplant). Both types of transplant are considered very aggressive treatments and have a high level of risk. They work very well for some patients but not for others, therefore transplants remain the subject of much controversy as researchers strive to learn their impact on overall survival.

Maintenance Therapy

Maintenance therapy is used alongside and after chemotherapy and/or transplant, and aims to prolong or maintain the remission period and improve quality of life. The following drugs have shown some benefit:

- Interferon which is normally produced by the body in response to infection is given by injection and can prolong remission, however it can cause flu-like symptoms.
- Steroids can also prolong remission.
- Bisphosphonates minimise bone disease, hypercalcaemia and pain.
- Erythropoietin stimulates red blood cell production and therefore reduces anaemia.
- Painkillers improve general quality of life.

- Antibiotics are frequently used to help the weakened immune system fight infection.

Aim of Treatment and Prognosis

Treatment is given to make the patient feel better and function better. It may also control the effects of the disease on normal body function, slow the disease down or halt it temporarily. Remissions can last from months to decades. Experimental treatments aim at cure, although none has yet been confirmed.

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Lines are open Monday-Friday, 9am-5pm and an answerphone is in operation at all other times. If you are answered by the answerphone, please leave your name and telephone number and we will contact you as soon as possible. Our telephone lines do not use Caller Display Equipment and we use Permanent Number Withhold on all outgoing calls.

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This booklet is one of a range of publications covering many aspects of living with Myeloma. Please contact the IMF(UK) for more details.

"Dedicated to improving the quality of life of Myeloma patients while working towards prevention and a cure".