

times when I had tingling in my hands and feet. I had also lined the pockets of naturopaths trying to find a remedy for my fatigue.

AP: *How did you react to the diagnosis?*

LC: There was a mixture of shock and relief. While there was relief that somebody knew what was wrong with me, I was horrified because my aunt had been disabled by multiple sclerosis and died at a young age.

AP: *What treatment did you have?*

LC: I was given cortisone tablets. The attack lasted three months and then I started on interferon injections. I was told these may help slow the progression of the multiple sclerosis.

AP: *How did you find the treatment?*

LC: I have a phobia about needles. Having to inject myself was one of my greatest fears. I could not even watch the video which showed you how to inject. I would sit for half an hour before I could insert the needle.

Although I now inject myself every other day I still need to call on my internal strength to do it.

AP: *Were there any adverse reactions?*

LC: At first the side effects were horrendous. I wondered what I was doing to myself. There was redness, swelling and tenderness at the injection site. I often would wake up at 2.00 a.m., after an injection, with severe pain in my legs. I would be shaking and felt like I had a bad dose of the flu. Sometimes I had to stay in bed all day to recover.

After about a month the side effects reduced. They are less of a problem now, so I would encourage other

people to persevere with their treatment as the initial severe side effects should not be long-term.

AP: *Have you used any complementary therapies?*

LC: I have tried them all, including high doses of intravenous vitamins. While some therapists say they can cure you, none of the therapies worked for me. I did find a mixture of Chinese medicine and massage improved my general well-being.

Changing my lifestyle has also helped. I exercise and have a good diet. High stress levels have an adverse effect on my condition, so I made the decision to retire from full-time work three years ago.

AP: *Has the treatment worked?*

LC: I have constant tingling, numbness and aches, but I do not let them restrict me. I am able to play golf and I have not had a serious attack since 1997. I see my neurologist once or twice a year and have a check of my blood tests. I would like to have another MRI to see if things have improved.

AP: *Is there anything you would like to say to doctors treating other patients with multiple sclerosis?*

LC: General practitioners are only going to have a couple of patients with multiple sclerosis, so they cannot be expected to know everything about the disease. They should encourage patients to have a positive attitude to the illness, and to maybe re-evaluate their lifestyle.

When you have multiple sclerosis you have to be prepared to take control and help yourself. General practitioners, therefore, need to be aware that most of their patients will be trying alternative therapies.

Patient support organisations

MS Australia

There are MS Societies in all States of Australia. These State Societies provide information and education for people with MS, families, carers and health professionals as well as the general community. They promote awareness of MS, and raise funds for research and service provision. They also provide support services such as the Immunotherapy Support Programs whereby MS Society nurses give information regarding the immune-modulating drugs, teach self-injection techniques, and offer ongoing support and advice in the management of any side effects.

MS Australia represents the national interests of people with MS, promotes and funds research and produces the quarterly magazine 'MS Life'.

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Grapefruit juice interactions

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Questions about the interaction of drugs with grapefruit juice have increased. I have therefore collated available data to produce a table which may help when assessing the significance and clinical relevance of an interaction. The full table is available with this article on the *Australian Prescriber* web site (www.australianprescriber.com).

The CYP3A4 enzyme system is found in the liver and in enterocytes. Some drugs are therefore metabolised as they are absorbed by the enterocytes. Drugs can also be pumped back into the intestinal lumen by a P-glycoprotein (Pgp) transporter. Pgp and CYP3A4 may therefore act in tandem as a barrier to drugs getting from the gut to the systemic circulation. Inhibition of either or both systems can increase the bioavailability of a drug.¹ Grapefruit juice appears to selectively inhibit CYP3A4 in the small intestine. However, the interactions are not simple competition for substrate metabolism, grapefruit juice acts by selective post-translational downregulation of enzyme expression in the intestinal wall.^{2,3} The inhibition can last up to 24 hours with a maximal effect when the juice is given with the drug or up to four hours before the drug.⁴

All interactions studied so far have used grapefruit juice.⁵ There are no useful studies with whole grapefruit.⁶ Sweet orange juice does not interact, however, Seville (or bitter) orange juice can inhibit CYP3A4 (although this does not affect cyclosporin⁷).

Of the many interactions studied only cyclosporin can be definitely said to have a clinically significant interaction. The clinical significance of increased concentrations of sirolimus and tacrolimus is less clear. Other interactions which may be clinically significant occur with amiodarone, atorvastatin, carbamazepine, felodipine and simvastatin.

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FURTHER READING

Martin J, Fay M. Cytochrome P450 interactions: are they clinically relevant? *Aust Prescr* 2001;24:10-2.