

Immunisation: Myths and Realities supplement Hepatitis B vaccine and multiple sclerosis

What is multiple sclerosis?

Multiple sclerosis (MS) is a chronic illness resulting from inflammation and scarring of the myelin in the brain and spinal cord. Myelin forms a protective covering over nerves, and without it, conduction of 'messages' along nerves is interrupted. People with MS can experience varying degrees of incapacity, depending on the location and severity of the scarring. Episodes of loss of vision and impairment of physical activity commonly occur in people with MS. The cause of MS is unclear, but genetic factors, geographical location and disruption in immune function may play a role. It is also possible that a viral infection may trigger the onset of MS.

What is hepatitis B?

Hepatitis B is a viral infection that causes an acute inflammation of the liver (hepatitis). It is transmitted by contact with blood and body fluids, for example by sexual intercourse, intravenous drug use and blood transfusion. It can also be transmitted from an infected mother to her baby around the time of birth. There is some evidence that children may transmit hepatitis B to each other through contact that occurs while playing together. Some people may become 'carriers' due to chronic infection. Chronic infection may lead to cirrhosis (scarring) of the liver or cancer of the liver.

How effective is hepatitis B vaccine?

The vaccine for hepatitis B is made by recombinant DNA technology, which produces inactive (non-infectious) subunits of the virus. When injected into non-immune people, the vaccine gives a high level of protection against hepatitis B infection.

Does hepatitis B vaccine cause multiple sclerosis?

There is no current evidence to indicate that hepatitis B vaccine causes MS. Concern about hepatitis B vaccination arose in France, which until recently had a large-scale population hepatitis B vaccination program. Over one-third of the entire French population has been vaccinated against hepatitis B. A few recent case reports were made in France of MS or MS-like illness following hepatitis B vaccination. As a result of this, the French government stopped their school-based hepatitis B vaccination program. When the French data were examined, however, the rate of MS in vaccinated people was not significantly different from the expected population rate.

In addition, there is very little else in the medical literature suggesting that hepatitis B vaccine causes MS. Specifically, there have been no large-scale population-based studies or clinical trials that have shown this to be a real relationship. Because of the large number of people vaccinated in France, it is possible that the MS case reports are purely coincidental to hepatitis B vaccination. Extensive pre-licensure clinical trials of hepatitis B vaccine did not document MS as a side effect. In addition, mass immunisation with hepatitis B vaccine in New Zealand, Taiwan and Alaska has not resulted in any serious adverse events or illnesses suggestive of MS.

In the USA, surveillance of adverse events after hepatitis B vaccination has also not shown any clear association between hepatitis B vaccine and serious adverse events. These findings provide important negative evidence, and suggest that if vaccination does cause MS, it does so extremely rarely.

With millions of vaccinations administered worldwide, it is likely that surveillance systems in some countries will receive some reports of MS that seem to be related in time to vaccinations. As with all such case reports, however, they only suggest the possibility of an association. Further controlled studies (which compare large numbers of vaccinated people with unvaccinated people) are necessary to establish causation.

Can hepatitis B vaccine make MS worse?

Worsening of MS can occur after non-specific viral illnesses. This is thought to be due to activation of the immune system caused by the infections. There have also been case reports of worsening of MS after vaccination in people who already have MS. A high quality study on the effect of influenza vaccine given to people with MS did not show any worsening of MS after vaccination. While this does not rule out an effect of vaccines on people with MS, it suggests that only a minority of MS patients, if any, will have their illness activated by vaccination.

Why is there so little research into this issue?

There is very little research in this area because, prior to the recent case reports, no association between hepatitis B vaccine and MS had been suggested. However, as a result of the case reports, there are large population-based studies currently being done in the USA and elsewhere to address this issue. The results of this research should be available in the near future.

For information on the Immunise Australia program:

Phone the Immunisation Infoline on 1800 671 811
Visit the Immunise Australia Website on
<http://immunise.health.gov.au>

Further reading

- US Centers for Disease Control and Prevention, Questions and Answers about hepatitis B and the Vaccine:
<http://www.cdc.gov/nip/vacsafe/concerns/HepB/q&a.htm>
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