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Dr C Bergin, IDS

Mr M Kelly (Editor), HPSC



Health Protection
Surveillance Centre

25-27 Middle Gardiner St
Dublin 1, Ireland

Ph +353 1 876 5300

Fx +353 1 856 1299

E info@hpsc.ie

www.hpsc.ie

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Mumps Outbreak Escalates

Over 1470 cases of mumps have been notified in Ireland in the first three months of this year, a sixteen fold increase compared with the same time period in 2008.



University or college was reported as the likely location for 65% of mumps cases where a setting for catching mumps was specified.

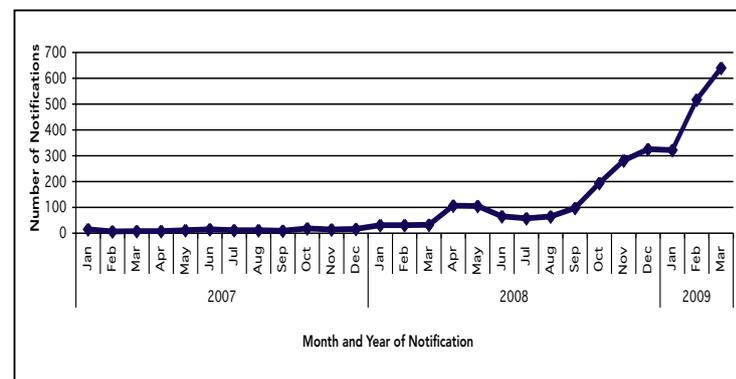


Figure 1. Annual mumps notifications 1988-2009*
*January-March 2009 data only

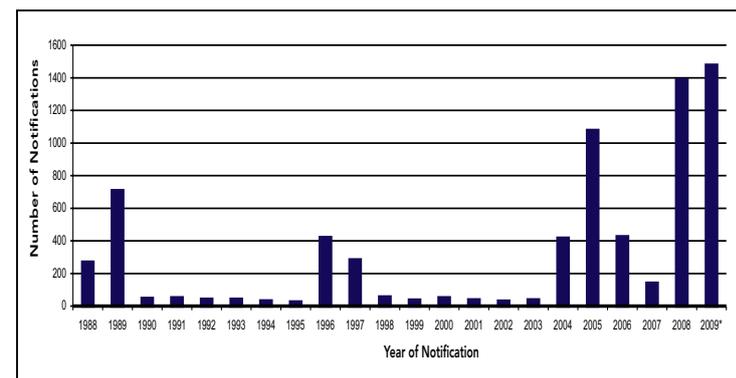


Figure 2. Number of mumps notifications by month 2007-2009*
*January-March 2009 data only

This is the largest number reported since mumps became notifiable in 1988, as illustrated in figures 1 and 2. This outbreak is occurring during a period in which large mumps outbreaks are also being reported in many other countries in Europe, Canada and the United States.

Mumps is a contagious viral illness that causes fever and tenderness of one or more salivary glands, usually the parotid glands. Complications of mumps can include inflammation of the testicles or ovaries, meningitis, deafness, pancreatitis and encephalitis. Mumps virus is spread from person to person through airborne transmission, by droplet spread, such as from coughs and sneezes, and through kissing or other direct contact with saliva of an infected person.

Over two thirds of the cases notified to date in 2009 were aged between 15 and 24 years while 86% were aged 15-34 years (figure 3).

Twenty nine per cent of all notifications reported a setting where mumps is likely to have been acquired. University or college was reported as the likely location for 65% of these cases.

Twenty five localised outbreaks were notified between January and March 2009, with 108 people reported ill. Eleven localised outbreaks occurred in private houses, seven in universities or colleges, four in schools and one each in a crèche, a public house and an unspecified location.

Health professionals need to be aware of 'low risk' Hepatitis E

Hepatitis E Virus (HEV) was first isolated at the beginning of the 1990s¹ and is endemic in many developing countries where it occurs both in sporadic form and in outbreaks.

In African and Asian countries it is responsible for acute hepatitis outbreaks due to the contamination of the water distribution system. In industrialized countries, HEV is now recognised as an emerging disease where an increasing number of locally acquired (autochthonous) infections has been noticed.² Its severity varies from asymptomatic or self limited disease to a fulminant or fatal disease. Mortality rates associated with HEV are low but can rise up to 20% in pregnant women in whom the disease is more severe. Chronic infection may appear in immune-suppressed patients e.g. organ transplant recipients.

HEV is a non-enveloped single strand RNA virus which belongs to the *Hepeviridae* family. The virus causing the disease in humans has four genotypes.² Most autochthonous cases occurring in industrialized countries are due to the genotype 3. The incubation period ranges between 14 and 60 days (mean 30-40 days). Transmission of the virus is primarily through faecally contaminated food or water especially in developing countries. Person to person secondary transmission seems to be rare (1 to 2% secondary attack rate) but can occur via faecal-oral routes. No vaccine is currently available. Some clinical trials are ongoing.

Locally acquired HEV in industrialized countries

In non-endemic settings, the reservoir of the disease is still unknown. The virus has been found in both domestic and wild animals. Recent studies suggest that HEV may in fact be a zoonotic infection. Phylogenetic analyses revealed some similarities between human strains and strains from pigs in the same area in the United States,³ Taiwan,⁴ the United Kingdom,⁵ Spain⁶ and the Netherlands.⁷ Occupational exposure to pigs

was significantly associated with higher levels of IgG anti-HEV in Moldova.⁸ In some studies, links were made between HEV and the consumption of uncooked deer⁹ and shellfish.¹⁰ Significant epidemiological associations were found between HEV cases and consumption of boar¹¹⁻¹³ and offal.¹¹ In addition, the virus is present in sheep, cattle and rodents.¹⁴ The virus was also found in sewage in Barcelona (Spain), Washington (USA) and Nancy (France).⁶

The demographic features of patients who acquired HEV infection in developed countries differ from those

in developing countries. According to descriptive studies in England and Wales, France and the Netherlands, most of the patients were male, Caucasian and aged over 55 years.^{10; 15-17} This is in contrast to developing countries where cases are usually reported in all age groups and in both sexes.¹⁸⁻²⁰

Serological Diagnosis

Serological diagnosis of acute infection is based on enzyme immunoassay (EIA) tests. IgM anti-HEV is usually detectable at the onset of symptoms (and maximum three months after), with abnormal liver function. IgG reaches a peak shortly after and can persist for years. The virus can be detected in serum and stools immediately before the onset of symptoms and until a few days after.

Surveillance in Europe

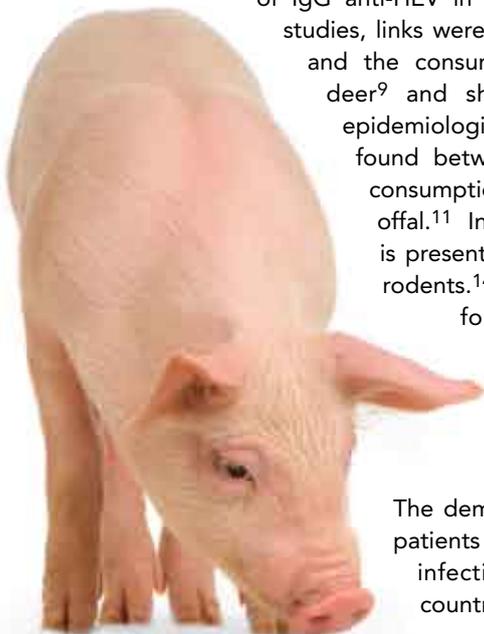
A number of European countries have recently begun to investigate locally acquired HEV.

Hepatitis E virus is notifiable in Germany where a total of 75 cases were notified in 2007 (including travel related cases). In 2006, a case control study was launched to determine the risk factors for autochthonous HEV.¹¹ The study included 45 cases and 135 controls. Offal and wild boar meat were found to be significantly associated with HEV infection.

In the United Kingdom, the disease is not notifiable, but a HEV enhanced surveillance programme covers all patients tested for HEV and cases confirmed as HEV positive by the two reference laboratories (Birmingham and Centre for Infection, Colindale, London). The objective is to ascertain and investigate non-travel associated cases of HEV in the UK and to identify potential risk factors. Descriptive results were published on 28 autochthonous cases interviewed, out of 329 hepatitis E notified in 2005.¹⁶ Most of the cases were Caucasian males over 55 years old who reported a high consumption of pork.

In France, a voluntary surveillance system using reference laboratories for HEV was set up in 2008. Enhanced surveillance of cases and a nested case control study among reported cases has been initiated in order to determine risk factors associated with local infection.

The disease is not notifiable in the Netherlands. However, a retrospective descriptive study including case finding through the different microbiological laboratories was performed in 2004-2006. A total of 19 cases were included in this study. Most of them were male (n=17/19), the median age of cases was 50 years, sixteen reported eating pork and six owned dogs.¹⁵



Transmission of the virus is primarily through faecally contaminated food or water especially in developing countries.

Epidemiology of Hepatitis E in Ireland

The disease is not notifiable in Ireland and few data concerning the epidemiology of hepatitis E in Ireland are readily available. A survey published in 1994 tested 45 haemodialysis patients for HEV infection. These patients were from different regions of Ireland. None of them were positive.²¹

A second serological survey published in 1995 tested 600 samples for HEV. These samples were tested in a laboratory which covered about 500,000 people in the southern part of Ireland. Five hundred samples were antenatal samples, the others were consecutive samples sent to the laboratory for serological diagnosis of hepatitis. Only six samples were found to be positive: two among 500 antenatal samples (0.4%) and four among the 100 other samples (4%), which indicated a low prevalence of HEV in Ireland.²²

The National Virus Reference Laboratory performs hepatitis E serology when it is specifically requested by clinicians. The test used is a Biokit hepatitis E IgM assay (Bioelisa HEV IgM; BIKIT, Barcelona, Spain).

Between January 2004 and December 2008, HEV testing was requested in the NVRL on 309 patients; 17(5.5%) were positive for HEV IgM. The number of requests increased from 26 in 2004 to 105 in 2008. Most of the cases were diagnosed in 2007 (8/17). Nine cases were male (53%) and the median age of the cases was 18 years (range: 2-48 years). Most of the cases (9/17) came from the Eastern Region. No information was available regarding travel history.

Discussion

Hepatitis E infection is increasingly recognised as a cause of liver dysfunction in developed countries where it appears to be a zoonotic infection. The number of people tested positive for hepatitis E in Ireland was very low during the last few years. Although the incidence of the disease is unclear in developed countries, health professionals here should be aware of the risk of autochthonous hepatitis E infection and should consider hepatitis E in the differential diagnosis of non travel associated hepatitis, regardless of the age and the sex of the patient.

The references for this article are available from the authors by contacting info@hpsc.ie

Nathalie Nicolay (1,2), Joanne Moran (1,3), Lelia Thornton (1)

- 1. Health Protection Surveillance Centre**
- 2. European Programme for Intervention Epidemiology Training**
- 3. National Virus Reference Laboratory**

In Brief...

Drop in TB cases

New provisional data shows that there were 437 cases of cases of tuberculosis in Ireland in 2008 – down from a preliminary figure of 474 cases in 2007.

The 2008 figure has also fallen compared with the latest finalised figures for tuberculosis when 465 cases were notified in 2006.

The overall preliminary rate for 2008 is 10.3/100,000, while the rate for the indigenous Irish population was 6.9/100,000.

Data on tuberculosis notifications remains provisional until all case outcomes are known, usually around 18 months after initial reporting.

Epi Insight goes interactive

This month's Epi insight will be the last edition to be published in 'hard copy' format. From next month on, Epi Insight will be published in a new interactive electronic format only. If you're not already on our e-mail list please contact maurice.kelly@hpsc.ie to make sure that you continue to receive Epi Insight.

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Mumps Outbreak Escalates (cont.)

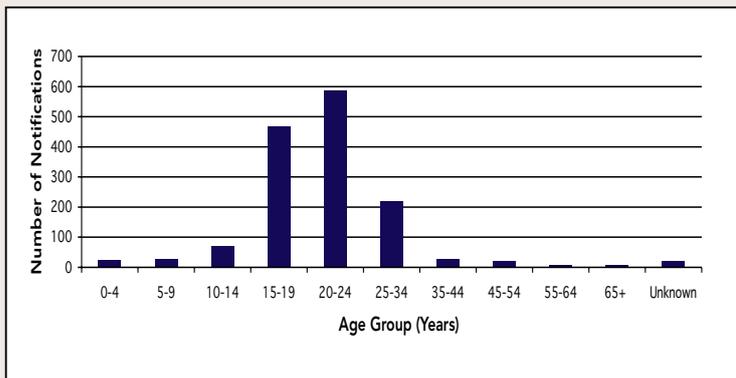


Figure 3. Number of mumps notifications during January-March 2009 by age group.

Mumps vaccine, available in the MMR vaccine, is the only way to prevent mumps and its associated complications

Enhanced clinical information was available on approximately a third of cases notified between January and March (n=499); 31 of whom were hospitalised with mumps, representing six per cent of all cases where hospitalisation status was known. Mumps orchitis was reported in 19% of males for whom enhanced information was available (n=50/265). Other complications reported among cases included, pancreatitis (3%, n=12/453), deafness (1%, n=5/451), meningitis (0.4%, n=2/460), mastitis (0.4%, 2/454) and encephalitis (0.2%, n=1/457).

Vaccination information is available for around one third of cases notified during January to March 2009. Of these, 114 (8%) were unvaccinated, 196 (13%) were reported to have had one dose of MMR, 247 (17%) were reported to have had two doses. Vaccination status was unknown or not reported for the remaining 62% of cases.

There are a number of sources for reported vaccination status, such as local immunisation databases, general practitioner's records and cases or parents recall. Due to recall bias by cases or parents, there may be some inaccuracies in these vaccination figures. Of the 247 cases reported to have had two doses of MMR both vaccination dates (availability of dates is used here as an indicator of accurate immunisation records) were reported for only 66 cases (27%); of these 66 cases, 20 (30%) were reported as laboratory confirmed mumps cases, thus these are confirmed vaccine failures.

The estimated herd-immunity threshold for mumps ranges from 88-92%. This is the proportion of the population that needs to be immune to mumps to prevent outbreaks occurring. Mumps vaccine, available in the MMR vaccine, is the only way to prevent mumps and its associated complications. High rates of vaccine coverage are needed to provide herd immunity. Even 95% coverage with 95% vaccine effectiveness – giving population immunity of 90% – may be insufficient if large numbers of susceptible individuals are in close contact with each other, even though such vaccination rates are in line with what is needed for herd immunity.

Recent studies suggest that one dose of MMR is 64-88% effective in preventing mumps illness and two doses of MMR are 88-95% effective.

Control measures in Ireland currently are focussed on:

1. Making sure that everyone under 25 years of age knows that two doses of MMR are recommended.
2. Anyone who is unsure about whether or not they have had two doses is advised to get the MMR vaccine from their GP or other health providers, like student health services.
3. The MMR vaccine is free to students, although GPs may charge a visit fee to non medical card holders. Student health services are free.
4. Anyone in this age group who is unsure of their vaccination status should get a dose of MMR. Even if an individual has (unknowingly) had two previous doses of MMR, a third dose will do no harm.

Most people older than 24 years of age are immune to mumps, typically as a result of natural infection, although individuals who were children in the 1980s may have been offered one or two doses of MMR when it became available in 1988.

Health care workers or students in the health sciences who were born after 1978 and do not have evidence of two doses of MMR or physician diagnosis of previous mumps infection should be given two doses of MMR, separated by at least one month, to prevent mumps spreading in health care settings.

Anyone who becomes ill with mumps should stay off work, school or college and avoid social settings where transmission may occur to non-immune individuals for five days after the development of parotitis.

The possibility of primary vaccine failure and waning immunity (secondary vaccine failure) has been recognised internationally as playing a possible role in the recent development of mumps outbreaks in developed countries. And although some outbreaks have been attributed to genotype G, different from that contained in the MMR vaccine (Jeryl Lynn strain is genotype A) this is not considered to be a major factor as outbreaks have successfully been controlled with MMR usage.

References are available from the authors by contacting info@hpsc.ie

Sarah Gee and Suzanne Cotter, HPSC