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The ABC of H1N1! Since the first cases of the so-called swine flu were diagnosed earlier this year, there has been sustained public interest in this topic. A series of scientific articles have reviewed the evolutionary and epidemiologic events that have led to the emergence of the current swine-origin influenza A H1N1 strain (*BMJ* 2009; 339: 368-9; *NEJM* 2009;361: 225-9,279-85). The influenza virus has 3 genera: A, B and C; A is responsible for illness on the pandemic scale. The letters H and N refer to 2 different surface proteins dotted over the surface of the viral envelope. H stands for haemagglutinin (HA), which anchors the virus to any cell it seeks to enter. [**HA is the antigen used to prepare anti influenza vaccines**] The N refers to neuraminidase (NA), an enzyme that helps the virus digest its way through mucous secretions as it approaches the host cell and also helps in the release of newly synthesised virus. [**Both of the currently available antiviral drugs work by inhibiting NA**]. Every influenza A virus is known to have a gene coding for 1 of 16 possible HA proteins and 1 of 9 possible NA proteins. Although this means a possible 144 total combinational possibilities, only 3 combinations (H1N1, H2N2, H3N2) have been found in humans, which implies some limitation to the virus's capacity to adapt to its human hosts. However, in order to counteract the development of immunity within the target population, the influenza virus is capable of undergoing regular "antigenic change". Therefore, the influenza vaccine for seasonal influenza is subject to yearly review and change in its composition. When there is a major antigenic change, this may result in the host having no immunity, despite recent vaccination or infection (as is thought to be the case with the new H1N1 influenza strain).

NOTE: The WHO has now officially changed the name of this pandemic virus to Pandemic (H1N1) 2009.

The influenza pandemic of 1918 is thought to have occurred as a result of emergence of a virus with major genetic changes. This new strain of influenza A H1N1 was seen to infect both man and pigs at the same time (the first time the disease had been described in pigs). The 1918 virus is understood to have continued to survive in each species, in one form or another, since then by a series of mutations/genetic changes in its composition. The current 2009 H1N1 pandemic virus is thought to represent another genetic product from this 1918 strain, from pigs. However, little is known about the process or the circumstances which enabled the crossover from pig to man to occur in this current pandemic.



Where to look for information on Pandemic (H1N1) 2009. A comprehensive series of easy-to-read practical guides has been developed by the Health Protection Surveillance Centre (HPSC) for use by health professionals and the general public in Ireland. These can be downloaded from: www.hpsc.ie. The list includes the following:

- In the health professionals site, specific guidance for GPs, hospital physicians, occupational health professionals, pharmacists, ambulance staff as well as a **dedicated section on antiviral medicines**
- In the general public site, a useful "Frequently asked Questions" document
- Dedicated section dealing with childcare and educational institutions
- A section called "Pandemic (H1N1) 2009 Update", **updated on a weekly basis**

Throughout there are links to other national centres (including the Irish Medicines Board, the HSE and Dept of Health & Children) and to international centres such as the WHO, the European Medicines Agency, US and European centres for disease control and prevention. The NMIC is also happy to assist enquirers with their specific queries. Just contact us at: nmic@stjames.ie



Thiazolidinediones and risk of fractures. Patients with type 2 diabetes (T2DM) are reported to be at increased risk of falls and fractures, despite showing increased bone mineral density. Several reports have suggested that the use of the oral antidiabetic agents (OAD) known as thiazolidinediones (TZD - rosiglitazone and pioglitazone) is associated with a 2-fold increased risk of fractures in female T2DM patients. A recent prospective cohort study evaluated the risk of fracture in all T2DM patients (mean age 59 years, 57% male), who began treatment with either a thiazolidinedione (n=17,476) or a sulfonylurea (n=73,863) during a 7.5-year period (*Arch Int Med 2009; 169: 1395-1402*). Exclusion criteria included use of other OAD or insulin in the previous 2 years and diagnosis of a fracture or admittance to a long-stay facility within the same timeframe. Results showed average duration of use of TZD was 460 days compared with 534 days for sulfonylureas. A total of 2,214 fractures were identified during the follow-up period. The average time to occurrence of any fracture event was 1.71, 1.66 and 1.44 patient-years for sulfonylurea, rosiglitazone and pioglitazone groups respectively. The majority (76%) of fractures were at peripheral sites. **Overall, there was a statistically significant 28% higher incidence of peripheral fractures in patients exposed to TZD compared with sulfonylureas.** In subgroup analysis it was noted that women on pioglitazone (but not rosiglitazone) showed significantly increased fracture rates compared with sulfonylureas. **In men, the association between overall TZD exposure and peripheral fracture was not significantly different compared with sulfonylureas but subgroup analysis showed a significant increase in men in the pioglitazone group compared with sulfonylureas.** Since the study was observational and there was overlapping of the confidence intervals in some of the subgroup analysis for rosiglitazone and pioglitazone, the authors comment that they are prevented from reaching a strong conclusion that the 2 TZD drugs have different fracture risks. However, they conclude that this study provides further data that treatment with TZD is associated with an increased risk of fracture, compared with sulfonylurea in women with T2DM and the results suggest that pioglitazone exposure might be associated with a stronger risk for both women and men, compared with rosiglitazone.



Drug Safety Update: **coloured medication and the colour blind** Colour may be considered a good way to differentiate tablets and their containers because it enables more immediate recognition than do for example words printed on labels or embossed onto tablets. Moreover, patients with poor vision or those requiring reading glasses may have difficulty reading small print or embossed text. However, a recently published article reminded prescribers and pharmacists of potential problems with use of colour coding in persons with colour blindness (*Lancet 2009; 374: 720*). **Approximately 8% of men and 0.4% of women have impaired colour-vision, of whom half are unable to recognise the main colours used in colour coding.** The article provided the results of a survey of 100 people with impaired colour-vision, in which 2% reported that they had confused their medication because they had mistaken the colour of tablets. Of particular interest, the article provided two graphic examples of potential problems. The first compared the colour profile of the various strengths of warfarin tablets in persons with normal vision with that in persons with impaired colour vision; this showed for example that the pink tablet was perceived as blue in those with impaired colour vision. The second example showed how 4 different coloured asthma inhalers might be perceived by persons with impaired colour vision, compared with the normal colour profile perceived by those with normal colour vision. These are two particularly important instances where identification and dosage are critical to ensure safety and efficacy of the prescribed medicine and where colour, if used to help the patient differentiate between preparations or doses, might lead to medication error in the presence of colour blindness.