



Swine flu and diabetes

Since the emergence in April 2009 of a novel swine influenza (H1N1) infection in humans,¹ both the popular and medical press have been preoccupied with the latest statistics, advice and anticipation of what might be ahead. Numbers with influenza-like illness have diminished as the UK summer comes to an end, but experience from previous pandemics warns of further waves to come. So far, few cases have required hospitalisation and these have been relatively mild in nature, affecting predominantly children under 18 years old. Furthermore, flu-like symptoms can be very variable and non-specific, such that not all cases suspected of suffering swine flu infection have been confirmed – only a relative few presenting to hospital services proving positive to H1N1 on viral screen.² However, this is certainly not a time for complacency as current reports from the southern hemisphere describe a much greater morbidity and mortality, with up to 25% of hospitalised patients needing intensive care,³ suggesting that the winter months are likely to herald an increased severity of infection and greater risk of complication, particularly to more vulnerable groups of the population. Successive influenza pandemics do appear to have become less severe,⁴ probably due to better medical and public health measures, but at this point in time much remains uncertain. Being prepared and maintaining due diligence remain crucial, including special consideration for those identified as being at greater risk.

Risks and contingency planning

People with diabetes are one such group and, in line with established guidance for seasonal influenza, diabetes is recognised as one of a number of associated medical conditions that confer greater vulnerability and risk of complications in the event of swine flu infection.⁵ Actual susceptibility to infection may be argued, but a large body of evidence, at least from *in vitro* studies,⁶ would indicate that poor diabetes control, hyperglycaemia and insulinopenia can all impair immune responses and thereby increase risk of infection. Indeed, one of the most important, but often overlooked, indications for good diabetes control is to minimise the risk of intercurrent infection. In contrast to earlier pandemics, an effective vaccine should be ready by this autumn and available for patients with certain underlying health conditions, including diabetes, as well as front-line health workers and young children. Recommendation of influenza vaccination for people with diabetes as a priority group is predicated on this identified risk,⁷ reducing hospital admission rate by two thirds for people with diabetes, who are otherwise potentially six times more likely to require hospitalisation during an influenza epidemic.⁸

Guiding principles for health service planning have been provided by the Department of Health⁹ for what is described as a 'rising tide phenomenon' and an expected surge of swine flu affected patients that will undoubtedly stretch the capacity of current clinical care resources. Nationally, NHS Direct and latterly the National Pandemic Flu Service have provided telephone

advice, but local health care services also need to put in place immediate contingency planning arrangements. Guidance is available from the Royal College of Physicians for hospital medical specialties, including diabetes,¹⁰ and from the Royal College of General Practitioners for primary care and the community.¹¹ Diabetes in particular does require an integration of district planning with close collaboration and communication between primary care and the local specialist diabetes team, ideally working through a designated diabetes-focused working group. This group will also have to meet the challenging ethical issues, yet to be fully articulated, of possible 'triage' decisions ('Canadian principles') should emergency services be overwhelmed, as well as personal responsibilities of 'duty of care'.^{12,13}

Inevitably, the main brunt of a worsening pandemic will be shouldered within the community and advice to primary care has been to avoid hospitalisation except for the seriously ill. To date, only a small group of swine flu related deaths in England has been reported and most would appear to have had other underlying medical problems. Diabetes has been mentioned in a few case reports, but specific details are as yet unknown. Capriciously, a very few deaths have occurred in otherwise healthy young adults. Diabetes adds another complicating factor that will need special consideration and will pose a challenge to existing diabetes services that have been established in primary care in recent years. For instance, significant numbers of people with type 2 diabetes on maximum oral hypoglycaemic agents may need to be switched to insulin with a matter of some urgency. Setting up a joint specialist–primary care contingency service in the community, particularly for insulin conversion, clearly has some imperative. Such an integration of care requires effective communication channels across a number of essential interfaces, including a dedicated telephone hot-line between primary care and the specialist team. Thus, preparations should be put in place by both general practices and hospital teams. Ideally, those patients with diabetes already known to be at higher risk (suboptimal HbA_{1c}, cardiac or renal complications) can be quickly identified from GP database registers, facilitating rapid review and referral for specialist assessment when needed.

Further organisational principles

Anticipating the additional impact on secondary care capacity, the district working group needs to determine those essential aspects of specialty service that must continue whatever the circumstances (new type 1 patients requiring insulin, pregnancy, serious life-threatening complications), and those routine elements of service that can be suspended safely for a period of possibly four months or so. Health care professionals will be under exceptional pressures. Availability of staff within the diabetes team may be compromised with some specialist nurses being seconded to assist on the acute medical wards, whilst some will suffer influenzal infection themselves and be temporarily unavailable for



work. Specific immunisation should be available as priority to front-line health care professionals which should minimise this risk – a particularly important consideration for those many individual health care professionals who also have diabetes, and where the principles of self-management become paramount.

Advice and guidelines

These organisational principles for meeting the challenge of influenza infection complicated by diabetes require pragmatic and explicit advice on medical management. Along with advised general measures,⁵ immunisation and antiviral therapy (Tamiflu or Relenza) when recommended, people with diabetes will be fully aware that closer attention to glycaemic control will be necessary, requiring more frequent blood glucose monitoring, drinking more fluids, checking for ketosis when advised, adjustment of treatment as appropriate and when to contact for medical advice. The importance of not discontinuing prescribed medication, particularly insulin, once again cannot be overstated. Local district guidelines already provide guidance on management of diabetes when ill ('sick-day rules') and some give excellent guidance for patients with flu infection.¹⁴

Health care professionals also need clear guidance on identifying those severely ill and most at risk, recognising the significance of serious adverse signs: disturbed consciousness, ketoacidosis, vomiting and diarrhoea, dehydration, respiratory distress and a worsening of associated complications (deteriorating renal function, development of heart failure), the presence of any one or more of which would be a likely indication for hospital admission. With these considerations in mind, the Association of British Clinical Diabetologists (ABCD) has published website¹⁵ guidelines for the management of diabetes in the event of swine flu infection with reference to the specific needs of both type 1 and type 2 diabetes as well as for those with renal and cardiac complications. Two appendices include guidance to diabetes service providers – for example, anticipating a five- to 10-fold increase in new case insulin demand – and also information for patients giving practical guidance on managing their diabetes during the time of infection.

Conclusion

What lies ahead is still unknown. We have experience from previous influenza pandemics. Media coverage of the 1918/19 swine ('Spanish') flu has highlighted the substantial mortality and morbidity that occurred at that time in a world struggling to recover after years of global warfare. Circumstances have no doubt changed, but the interaction between diabetes and swine flu infection will

be unpredictable and very variable. Assessment should be on an individual basis taking into account severity of infection and symptoms experienced, the presence of associated long-term diabetic complications and the development of serious adverse signs. Ideally, people with diabetes should be pre-prepared through education so that they can undertake personal responsibility and appropriate self-management at the time of infection. However, it is essential that a local specialist diabetes advisory service is available to the at-risk population for urgent advice on medical management, to offer immediate resource for insulin conversion in the community and to assist decisions, including triage, concerning hospital admission.

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Conflict of interest statement

There are no conflicts of interest.

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