Newcastle Neonatal Service guidelines
Pandemic Influenza

Background

In July 2009 the World Health Organisation declared the pandemic a phase 6 outbreak. The guidance below is intended to offer a sensible approach to what is inevitably a fluid situation. Since specific details of guidance are continually being updated by the Department of Health (DoH) it is important not only to consult this guidance for general approaches advised by the Newcastle Neonatal Service, but also refer to the DoH website for updates (www.dh.gov.uk).

Issues specific to neonatology

Below you will find guidance on maternal and neonatal issues including care of the infant after discharge. Cross reference with the women's services guidelines Pandemic influenza guideline is recommended.

Maternal infection

In pregnancy:

Treatment: women may worry and ask about the impact of treatment to them on their baby. Although data is limited, women should be advised that the benefits of treatment (with either zanamivir (relenza) or oseltamivir (tamiflu) are thought to outweigh any known adverse effects on the fetus or newborn baby, and that there are risks to both her own health and that of her baby from severe infection from untreated flu.

Little is known about the long term effects of fetal exposure to either antiviral medication or the virus itself. It is suggested that we identify which infants undergo exposure to the virus or treatment in order to allow future follow up of such exposed infants. This exposure should be documented in the infant notes.

It is unclear whether this virus can cause true congenital infection; in a symptomatic mother delivering an unwell infant screening the infant is warranted, but treatment for other (bacterial) pathogens must also be undertaken until a positive diagnosis is established (see under infant infection below).

At delivery:

If a mother is known to be actively infected at delivery she (and the newborn baby) will be nursed either in isolation or in cohorted bays, depending on the numbers of infected hospitalised individuals.

Early discharge from hospital is to be encouraged to limit viral spread within the hospitalised population. If the mother requires ongoing care but the infant is well, discharge to other family members who are well should be discussed with the family as a possibility. As usual mothers leaving hospital with a young newborn infant need rapid telephone access back to healthcare professionals to seek advice about their newborn infant – they may need general advice as for any new mother and baby, or specific advice regarding possible influenza in their baby. Contact with the community midwife, postnatal

ward or GP should be advised, and telephone calls to MAU by mothers with such queries referred on to the neonatal team as usual. Routine queries should be dealt with in the usual way by telephone wherever possible. If the infant requires assessment this should be arranged taking care not to expose infected or potentially infected individuals to non-infected. Precise locations of review will depend on numbers of infected hospitalised individuals. If you are unclear where to arrange review, please discuss with the consultant.

Feeding:

Mothers should be reassured that breast feeding is the best for her baby even if she has flu symptoms. If the mother is actively infected the use of a surgical face mask by the mother whilst feeding and providing intimate care (nappy changing etc) should be encouraged. Antivirals are transmitted in breast milk but there is no evidence that this is harmful. If the mother chooses to bottle feed this may be delegated, along with other care giving activities, to an asymptomatic individual if possible.

Parents with an infant in NICU:

Parents with active influenza symptoms should not be allowed to visit infants in the neonatal unit until their symptoms have resolved. The exact length of infectivity is unknown, but is likely to be around 5 days.

Infant infection

Diagnosis:

Young infants with symptoms of infection should be assessed with great care because of the potential for an alternate (bacterial) infection. Although swabbing and identification in the community is not an active part of phase 6 management, infants in whom there could be a serious differential diagnosis will benefit from a diagnostic flu test using viral nose and throat swabs. This requires processing at the Health Protection Agency, and an answer should be available within 24 hours of testing. Treatment may be initiated whilst awaiting the result (see below) but **should be stopped if the test is negative.**

Treatment options:

Few pharmacokinetic or clinical data are available assessing the risk benefits for treatment of very young infants.

The European Medicines Agency reviewed available evidence and has suggested that although unlicensed **Oseltamivir** (tamiflu) is the preparation of choice for infants. It is available in liquid formulation (licensed for infants >1year) but has been used in other situations in infants below this age. Oseltamivir is an ester prodrug activated by hepatic enzymes to the active hydrolytic metabolite oseltamivir carboxylate which is an influenza neuraminidase inhibitor. The enzyme required is human carboxylesterase (HCE) 1. Due to immaturity of the enzyme systems infants below 2 months may not activate the drug well.

Very little is known about the possibility of using enzyme inducing drugs like phenobarbitone to promote active metabolism. Please discuss this with a consultant if an infant is very unwell.

Excretion is predominantly renal, and infants with significantly impaired renal function may require a dose reduction.

Treatment dose: **2mg/kg twice daily for five days** – this is most effective if commenced before 48 hours of symptoms.

Two liquids are available, please take care when drawing up doses:

Solution = 15 mg/ml Suspension = 12 mg/ml

See cBNF for current recognised side effects. Due to the lack of previous use in very young children, all suspected side effects should be reported through the yellow card scheme.

Zanamivir (relenza) is available only as a dry powder that is inhaled directly into the lungs. It does not require enzyme activation and is renally excreted as whole drug. Clinical trials in children are limited. There is no nebulised form. It is unlikely therefore that the neonatal population would benefit from dry powder inhalation as a means of treating or preventing flu.

Who to consider for treatment/prophylaxis:

- Infants born to recently infected mothers (<48 hours)

These infants are most likely to have been exposed to a high viral load, but not yet have received significant transplacental antibody protection and so are probably at high risk of severe illness. The risk/benefits are probably in favour of prophylaxis and this should be discussed with the parents. Prophylaxis is 2mg/kg **daily** for **ten** days.

- Infants with clinical symptoms on the postnatal wards

These infants should be clinically assessed with particular emphasis on the possibility of alternate underlying bacterial disease and treated accordingly until blood culture results are known. If fever, respiratory symptoms or gastrointestinal upset are present nose and throat swabs for flu should be sent and treatment with oseltamivir may be required after discussion with the consultant until results are known, but should be stopped as soon as the swabs are known to be negative.

- Infants with clinical symptoms at home

These infants should be assessed by the most suitable health professional available (GP or midwife / health visitor) and referred on through either paediatrics or neonatology as necessary. Unless the infant is an ex-preterm infant initial calls should be to paediatrics. Treatment will be undertaken on as risk benefit basis on the balance of probabilities of infection.

- Infants with clinical symptoms in NICU

These infants require urgent assessment and swabbing with viral nose and throat swabs and treatment with oseltamivir until results are known. Antibacterial agents will almost certainly also be required to cover possible alternate diagnoses.

- Infants in NICU exposed by staff or parents

If an infant is known to have been exposed to infected staff or an infected parent, the risk/benefits of prophylaxis need careful evaluation and depend on the underlying condition of the infant. Sick, extremely preterm, ventilated or infants with uderlying chronic

lung disease are most likely to benefit from prophylaxis, but this should be discussed with the consultant and parents. Prophylaxis is 2mg/kg **daily** for **ten** days.

Nursing and isolation:

Infants nursed in incubators are both protected from droplet transmission and unlikely to transmit infection provided that the carers practice good hand hygiene measures. Where numbers permit or demand, we will cohort nurse infants in intensive or special care within bays.

Transfer of infants in to and out of neonatal intensive care:

Most transfers in neonatal intensive care are emergencies and cannot be deferred however in the midst of a pandemic consideration to delaying semi-elective surgery that might require transfer to another hospital (e.g Freeman) should be made.

If a pandemic is causing significant neonatal morbidity it may be appropriate to utilise network beds in a slightly different way than normal. Infants requiring transfer around the region should be carefully discussed with the consultant.

Infant deaths:

Staff must wear personal protection equipment and follow standard infection control principles if an infant has died whilst infected with flu. The body should be wrapped in a sheet and transferred to the mortuary as soon as possible. If the family wishes to view the body, they may be allowed to do so but must follow standard infection control principles.

Staffing issues

PPE:

Separate guidance exists on infection prevention and control precautions for pandemic influenza and should be adhered to (see trust intranet site guidance on personal protective equipment)

During the pandemic infants not known or suspected to be infected with flu should be managed with our standard precautions, emphasising as always the importance of hand hygiene. Infants who are infected should be either nursed in incubators or in cohorted bays.

Special precautions are required for staff undertaking procedures that expose them to aerosols – for practical purposes for us this means intubations/suctioning/cough inducing physiotherapy/nebulising/ventilated/CPAP/vapothermed infants for which FFP3 face masks must be used in addition to standard precautions for caring for an infected patient.

Infected staff:

Syptomatic / infected staff should inform their immediate manager and currently will be swabbed to determine whether they do or do not have the virus, and if so they should not attend work until they are symptom free.

In a situation of a large outbreak leading to serious staff shortages the situation will require daily assessment. (further guidance on intranet under occupational health)

References

(see also DoH Pandemic flu site)

Use of antiviral drugs in an influenza pandemic - scientific evidence base. Available from: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_077276

Department of Health. Recommendations on the use of antiviral medicines for pregnant women, women who are breastfeeding and children under the age of one year. 2009.

The RCPCH consensus statement available from: www.rcpch.ac.uk/Research/CE/Guidelines-frontpage/Guideline-Appraisals-by-Topic/practice-statements

EMEA, Guidance on use of antiviral medicines in the event of an influenza A/H1N1 pandemic, available from: www.emea.europa.eu/humandocs/PDFs/EPAR/tamiflu/27353509en.pdf

Committee on Infectious Diseases. Prevention of Influenza: Recommendations for Influenza Immunization of Children, 2007–2008. Pediatrics 2008;121;e1016-e1031

Richard J. Whitley, Arnold S. Monto. Prevention and Treatment of Influenza in High-Risk Groups: Children, Pregnant Women, Immunocompromised Hosts and Nursing Home Residents. JID 2006;104 (Suppl 2):s133-138

Okamoto, S, Kamiya, I, et al. Experience with Oseltamivir for Infants Younger Than 1 Year Old in Japan. The Pediatric Infectious Diseases Journal June 2005; Vol 24 (issue 6):575-5
Roche Pharmaceuticals. Alert letter December 2003. Available from: www.fda.gov/medwatch/SAFETY/2003/tamiflu-deardoc.pdf

Pandemic Influenza

Information for parents

We know that this is a worrying time for you and would like to reassure you that we are actively addressing issues that might affect you and your baby.

We hope that you find the following information helpful, and if you would like to discuss this with us further then please ask to speak to one of the consultants.

- **Hand hygiene**
  - Pandemic flu is transmitted by droplet infection – infants within protected environments like special care are therefore relatively unlikely to contract it, but careful hand washing is vital

- **Visitors**
  - Symptomatic individuals should NOT visit special care
  - At present there are no 'extra' restrictions to visiting, but if levels of infection in the community rise we may feel that restrictions (for example parents only visiting) are necessary
  - Please let us know if you or another recent visitor to your baby is being treated for swine flu

- **Treatment**
  - If necessary there is a treatment that we can use in small babies. Like everything there are potential benefits and risks. We would talk to you about this at the time

- **Prevention**
  - We hope that special care can remain 'virus free' but it is possible that a relative, staff member or baby may become infected. There is a preventative medicine that we can use if we feel that we need to. Again this would be carefully talked through with you at the time