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Management of babies at risk of Blood Borne Viruses in the perinatal period:

Hepatitis B – please also see Hepatitis Resource Pack A and Resource Pack B

Introduction

Background

- Hepatitis B virus is acquired though contact with blood and body fluids.
- Most carriers acquire the virus from their mother perinatally or by exposure in early childhood.
- Some patients may have acquired Hepatitis B though intravenous needle sharing or sexual contact.
- Following Hepatitis B infection as an adult, 90% of individuals clear the virus, become immune and are not infectious to others.
- However, with infection acquired at birth, up to 90% will not clear the virus and will become chronically infected.
- Chronic infection is indicated by a positive surface antigen result (HBsAg).
- If the hepatitis B e-antigen (HBeAg) is also positive, this means that the patient has viral protein associated with a high level of infectivity.
- Perinatal transmission can be prevented by administration of a course of active immunisation (Hep B vaccine) together with Hepatitis B immunoglobulin (HBIg) at birth where indicated (See flow diagram below)

There are 3 groups of babies at risk of acquiring Hepatitis B:

1. Babies born to mothers who have had Hepatitis B infection
2. Babies born where a household member has Hepatitis B
3. Babies born to parents who are problem drug users

1. Babies born to mothers who have active Hep B infection

- Hepatitis vaccine given at birth has been shown to be effective in 95% of infants at risk.
- Refer to flow chart below and Section A - Hepatitis B vaccination for babies born to mothers with Hepatitis B infection

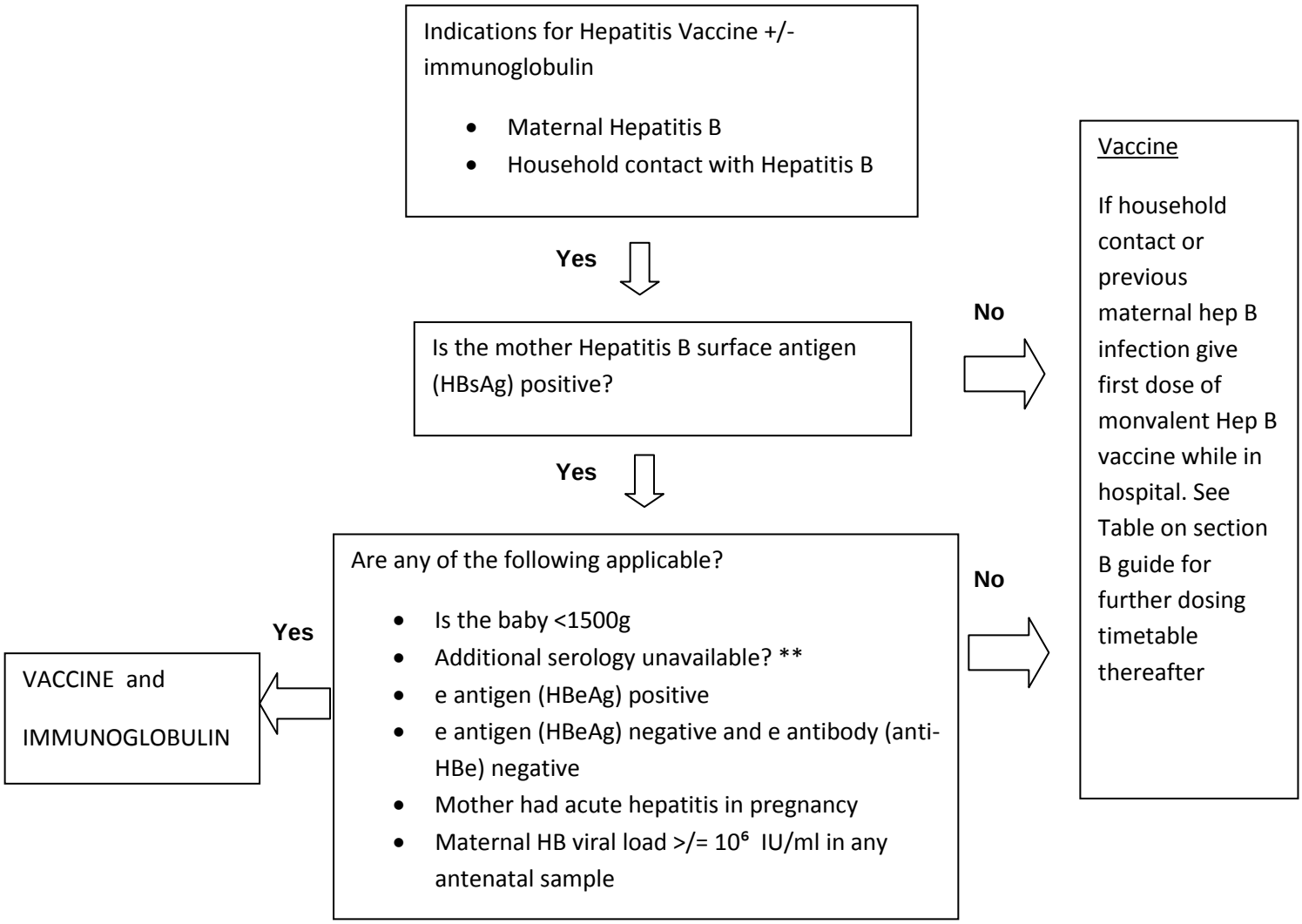
2. Babies born where household member has Hepatitis B or mother has had and cleared.

- Should be offered the monovalent Immunisation soon after birth as it would reduce transmission through exposure to mucous membranes or minor cuts
- It is important to ensure that at-risk children are protected because children infected with Hepatitis B have a higher risk of developing chronic infection than adults.
- Refer to Section B - Hepatitis B vaccination for babies born to a household with an infected contact (not the mother)

3. Babies born to parents who are problem drug users

- Drug users are at ongoing risk of acquiring HBV due to sharing of injecting equipment and through sexual spread.
- Children of problem drug users are susceptible because they live in a high risk environment, with close household contact between parent and child, and with other children.
- It is important to ensure that at-risk children are protected because children infected with Hepatitis B have a higher risk of developing chronic infection than adults.
- These infants do not need the monovalent immunisation after birth but would be offered the vaccine as part of standard Immunisation schedule where new hexavalent vaccine is given at 2, 3 and 4 months.

Flow diagram to determine if babies require additional monovalent hepatitis B vaccine +/- hepatitis immunoglobulin:



** if no additional serology available, assume high risk and give baby HB immunoglobulin.

Protocol

- In BGH, all women are screened for hepatitis B at booking. Confirmatory testing including hepatitis e-markers, viral load and liver function will be performed. Women have repeat serology again at 28 weeks gestation.
- All women will also be asked about problem drug use, both personal and relating to their partner.
- The obstetrician will inform paediatrics (Dr Clare Ketteridge is currently the link paediatrician) via clinic letter of any pregnant women whose babies are at risk of Hepatitis B. A paediatric plan will be put onto maternity BadgerNet and also into the antenatal concerns folder on SCBU.

Hepatitis B Immunoglobulin

- Give within 12 hours of delivery, but preferably within 4 hours, especially if mother HBeAg positive.
- This must be ordered from pharmacy when open. If required out of pharmacy-hours, it can be obtained from the Hospital bleep holder (on bleep 1412 or via switchboard).
- A pharmacy order for Hepatitis B immunoglobulin needs to include the following details: name, unit number, dose, route and prescriber.
- If 200 unit vials are unavailable, please use the 500 unit vials provided. The dose is 200 units by IM injection. Check the vial for concentration in units/ml and draw up and give the appropriate volume to administer 200 units. Discard what is unused.

Vaccine

- The vaccine can also be obtained from pharmacy. The dose of HepB vaccine depends on the brand, but the volume given should always be 0.5ml so either 5 or 10 micrograms may be given. Please prescribe as 0.5ml IM injected into the upper anterolateral thigh of the opposite limb to that used for Ig injection. Ensure that the brand and batch number are recorded.
- Give at same time as immunoglobulin if possible, ideally within 4 hours, and otherwise not later than 24 hours after birth.

Infection control

- Universal precautions and sample labelling.
- No isolation necessary.
- NB - very low risk of acquiring infection from baby at birth.

Breast feeding

Hepatitis B in the mother is NOT a contraindication to breast feeding. The baby is protected through passive and active immunisation.

Communication and Follow-up

- The neonatal nurse practitioner / paediatric doctor will complete a form to inform the Scottish Immunisation Recall System (SIRS) that the baby has had the first dose of vaccine. Information will also be entered on maternity BadgerNet.
- Further doses of vaccine are given at 1 month (if required) and during standard immunisation protocol. These will be administered on ambulatory care Ward 15.There is a letter contained in the Hep B resource pack if the baby is on the postnatal wards which is sent to the GP. If the baby is admitted to the neonatal unit, this information should be clearly communicated in the discharge letter.
- Parents should be given an information leaflet
- Please use the correct resource packs as there are 2 different Hep B resource packs:
    - Mother with Hepatitis B infection
    - Household contact positive.

Hepatitis C infection in mothers

Introduction

Hepatitis C has a prevalence of approximately 0.8% in the Scottish population, rising to 50% in intravenous drug users. As a blood borne virus it can be transmitted to the fetus, potentially leading to infection of the newborn infant. The risk of transmission of infection is around 5%; though double that if there is concomitant HIV infection.

Indications for maternal testing

Hepatitis C virus (HCV) testing is not part of the routine antenatal screen but testing can be performed during pregnancy to determine HCV status. Indications to consider HCV testing:

- History of IV drug use (self/partner)
- Persistent abnormal ALT
- Recipient of blood products or components prior to 1992
- Sexual partner who is HCV positive
- Received medical (inc. IVF) or dental treatment in a country where infection control may be poor.
- Received exposure to blood (e.g. needle stick injury) from someone known or high suspicion of HCV
- Partner is known positive for any blood borne virus.

HCV diagnosis in Mother

Testing for HCV can be performed on antenatal booking blood and requested as additional test on antenatal screening. Informed consent should be obtained from the woman prior to testing, though written consent is not necessary.

- The HCV test can be performed on serum (9ml White cap tube)
- If HCV antibody positive – presence of HCV RNA will automatically be determined on same sample
- It is important to determine the mother's HCV RNA status during pregnancy, as follow-up of her baby depends on this result. In some instances (e.g. where there was insufficient blood in the first sample) an EDTA plasma sample (Red Cap tube) may be required to determine the RNA status with PCR - the lab will ask for this to be done.

Pregnant women who are **HCV antibody positive but HCV RNA negative** do not pose a risk of transmission to their child:

Pregnant women who are **HCV RNA positive**:

- The risk of mother-to-child transmission is approximately 5%
- Standard obstetric management (Unless HIV positive as well) is appropriate
- Breast feeding is not contraindicated in maternal hepatitis C
- Infants will need to be followed up by paediatrics

HCV screening in infants

Natural history

Infants born to women who are HCV antibody positive will test positive for HCV antibody at birth. Infants who are not infected become negative for HCV antibody between six and 20 months of age. Around 80% will be negative by 12 months of age.

Positive results for viral RNA may be obtained in the early months of life in children who subsequently become negative and lose HCV antibody. Some infected infants may not become HCV RNA positive until 2 months of age or thereafter. A recent study indicates that the sensitivity of a positive PCR

result obtained on two occasions between two and six months of life in predicting infection is 81% (CI 58-97%). In HIV co-infection, infants consistently positive by RNA may have negative HCV antibody tests between 12 and 18 months of age.

Progression to severe hepatitis or cirrhosis in childhood is rare (<5%). There is a slow non-linear progression of fibrosis with age. The mean time to development of cirrhosis in individuals infected as infants is estimated at 28 years.

Potential treatment

Children that are demonstrated to have acquired infection will be followed up by the gastroenterology team and are assessed for the development of liver disease.

Anti-viral treatment is available and response rates to treatment in children are of a similar magnitude, and show the same influences of Hepatitis C genotype, to adults. Combination treatment with interferon and ribavirin renders Hepatitis C nucleic acid negative in 50-60% of cases. There is a potential for effects on thyroid function and growth problems, so in those with mild disease the positives and negatives of treatment must be weighed up

Which babies to screen?

Action depends on the viral status of the mother; it is therefore essential that you ascertain from a reliable source – her notes – whether she is RNA positive or not. This is more important in determining your action than antibody status.

- Infants born to HCV RNA positive mothers should be referred to paediatrics
- Note therefore that infants born to HCV RNA negative mothers do not need testing or follow-up

Neonatal screening procedure

- Bloods are not required from the infant at birth. It is important to inform the mother of the need to refer to paediatrics for follow-up.
- The baby will require HCV RNA testing on EDTA plasma at 3 and 9 months and HCV antibody testing at 18 months. An appointment for serology testing should be made in ambulatory care for 3 months of age.
- Please inform Dr Clare Ketteridge of the baby's birth and arrange follow-up at 6 months in her BGH clinic. If Dr Ketteridge is not available please inform locality consultant.

Reference:

Scottish Intercollegiate Guidelines Network- Management of hepatitis C – A national clinical guideline, July 2013

Infants of HIV positive mothers

Summary

After the baby has been born the neonatal staff are required to perform the following:

- Take blood for proviral DNA, FBC, U&Es and LFTs
- Prescribe appropriate antiretrovirals
- Refer to infectious diseases team at the RHSC for follow up

Introduction

With current antenatal and perinatal treatment the rate of transmission of HIV from a mother to her baby is very low, at 1.2%[1]. This relies on many steps being taken correctly, including the management of the baby after delivery.

Principles of management:

- Minimise the maternal viral load before delivery (aiming for an undetectable viral load)
- Minimise contact with potentially infected fluids at delivery
- Early treatment with postnatal antiretroviral drugs
- No breastfeeding

Minimising the maternal viral load before delivery

Antenatally a combined obstetric/GUM/infectious diseases team manages this. The plan for the baby after delivery depends largely on the maternal viral load so those managing the baby should be aware of this.

Minimising contact with potentially infected fluids

- Immediately after delivery the Labour Suite Midwives will wash the baby carefully to remove maternal blood and secretions, particular attention being paid to the oropharynx and vagina.
- The washing must be done in a warm room and the baby dried thoroughly afterwards.
- The skin must also be cleaned thoroughly before injection of IM vitamin K.
- Breast feeding is contraindicated in the UK.

Early treatment with postnatal antiretroviral drugs.

- The midwife/obstetrician should inform the on call paediatrician when a baby is to be delivered to a mother with HIV to allow time to organise investigations and drugs.
- Mothers who are known to have HIV will carry have a retrovirus care plan which details the postnatal management. If this care plan is not available instructions on treatment will be available from Dr Jones who can be contacted via the RHSC switchboard at any time. During “office hours”, they can be contacted through their secretary on 20971 (external line 536 0971).
- For most mothers with undetectable viral loads the baby is treated with oral zidovudine- see monograph. If the viral load is higher, triple therapy may be required with zidovudine, nevirapine and lamivudine.

Investigations

Before these drugs are commenced bloods are to be taken from the baby as follows:

- FBC (0.5ml pink EDTA tube)
- U&Es and LFTS (0.5ml orange top LiHep tube)
- HIV pro viral DNA (2ml pink EDTA tube)

It is prudent to allow a short time to pass after birth to allow the peripheral circulation to improve, as this will make taking blood easier. Bloods should be taken and drugs commenced within 4 hours.

Prescribing drugs

For all drugs see the monographs for doses and frequencies. The paediatrician prescribing should ensure that all doses are written out as the dose in mg, and the volume and concentration of the solution being used to ensure clarity for those administering the drugs. All doses should be rounded up to an easily administered volume for simplicity and to account for postnatal weight gain. For example:

For a 3.1kg baby, 4mg/kg=12.4mg (1.24ml), round up to 13mg

PRESCRIPTION		Patient's Own Medicine
Medicine (Approved Name) **ZIDOVUDINE**		For use
Dose **13mg (1.3ml of 10mg/ml solution)**	Route **Oral**	Quantity
Notes **4mg/kg/dose**	Start Date 01/01/09	Date
Prescriber- sign + print **I M Smart (DR I M SMART)**		Pharmacy

The medicine bottle does not need to be labelled by pharmacy with the dose before the baby can receive it, but must be labelled before discharge.

BCG

Many infants born to women with HIV will be at risk of TB on account of ethnicity. However the BCG immunisation should not be offered to these babies until testing has shown them to be HIV negative. This will be arranged by the infectious diseases team.

Prematurity/nil by mouth

- If babies are born prematurely or are too sick after delivery to tolerate oral medications immediate advice should be sought from the infectious diseases team
- The only drug available via the intravenous route for premature or sick neonates is AZT.
- If other medicines are required then the aim should be to start them enterally as soon as possible (the baby does not have to be on full feeds for this) - the volumes given are usually small
- Preterm or sick infants may also be more at risk of adverse effects from antiretrovirals and consideration should be given to monitoring lactate levels, LFTs, FBC and triglycerides.

Follow up

Dr Laura Jones at RHSC Edinburgh will arrange blood testing and follow up post referral letter to:

Dr Laura Jones
Royal Hospital for Sick Children,
50 Little France Crescent
Edinburgh EH16 4TJ