Waikato District Health Board

Procedure

Management of Conjugated Hyperbilirubinaemia in Newborn Intensive Care Unit

Procedure Responsibilities and Authorisation

Department Responsible for Procedure	Newborn Intensive Care Unit (NICU)
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Target Audience	NNPs, CNSs, Registrars, SMOs and Nurses
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Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
03	L Carpenter	27/03/2020	Heading, fat soluble vitamins

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Contents

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1 Overview

1.1 Purpose

To provide a clear investigative and treatment plan for infants with Conjugated Hyperbilirubinaemia.

1.2 Scope

Waikato DHB staff working in NICU e.g. medical staff.

1.3 Patient / client group

Neonates and Infants in NICU.

1.4 Definitions

CNS	Clinical Nurse Specialist
Conjugated Hyperbilirubinaemia	A direct (or conjugated) bilirubin greater than 20 micromol/L or more than 10% of the total bilirubin if the bilirubin is greater than 200 micromol/L.
Medical Staff	In NICU they include Neonatal Nurse Practitioner, Clinical Nurse Specialist, Registrar and Paediatricians.
NNP	Neonatal Nurse Practitioner
SMO	Senior Medical Officer
Prolonged jaundice	Jaundice persisting for more than 14 days.

2 Clinical Management

2.1 Risk Factors

- New onset of jaundice after the first week of age should be considered abnormal.
- Persistence of jaundice beyond 14 days of age in infants with a gestational age of 37 weeks or more, or beyond 21 days in infants with a gestational age of less than 37 weeks, should be considered abnormal.
- Association of pale stools or dark urine should be an alert for cholestasis.

2.2 Stool Chart

Stool colour is a useful screen for detecting biliary obstruction (primarily, biliary atresia). Stools in biliary obstruction are persistently pale. Urine colour may be dark or orange. Stools that are pale or acholic require investigation.

Refer Stool Chart: https://www.childliverdisease.org/wp-content/uploads/2018/01/Yellow-Alert-Stool-Chart-Bookmark.pdf

2.3 Investigations

Refer to guidelines Starship Investigation of Prolonged Jaundice, and Appendix A: Waikato DHB clinical form - Investigation of Conjugated Hyperbilirubinaemia.

2.4 Treatment

All infants undergoing investigation of conjugated hyperbilirubinaemia should commence fat-soluble vitamin supplementation as soon as possible and supplementation should be administered **enterally** until some weeks after resolution of the jaundice.

Usual doses are:

- Klaire Labs or Seeking Health Vitamin A drops, 6 drops (0.18 ml) daily
- Colecalciferol (Puria) 0.5 ml daily
- Micel-E 0.5 ml daily
- Vitamin K 2 mg daily

Ursodeoxycholic Acid:

The gastroenterology service may advise commencing Ursodeoxycholic acid (URSO) at a dose of 20-30 mg/kg/day in 2 divided doses. URSO is a naturally-occurring bile acid that stimulates bile flow.

2.5 Potential complications

Incorrect dosing of vitamins.

3 Audit

3.1 Indicators

- Timely peer review of protocol.
- Prescription of fat-soluble vitamins.

3.2 Tools

Refer Appendix One: Waikato DHB clinical form - Investigation of Conjugated Hyperbilirubinaemia

4 Evidence base

4.1 Summary of Evidence, Review and Recommendations

Conjugated Hyperbilirubinaemia is a relatively common occurrence in neonates admitted to NICU. Generally it is seen in extremely immature infants who are recovering from illnesses, and who have had prolonged intravenous nutrition.

4.2 Associated Documents

Vitamin K (phytomenadione) for neonates in NICU - Waikato DHB Drug Guideline reference number 2980.

4.3 Bibliography

Chin, S & Mouat S. Jaundice – investigation of prolonged. February 2020. https://www.starship.org.nz/guidelines/jaundice-investigation-of-prolonged

Mckiernan P. Neonatal cholestasis. Seminars in Neonatology. 2002 7 (2): 153 - 165

Starship Pharmacy and Infectious diseases team. Newborn Services Clinical Practice Committee. Conjugated Hyperbilirubinaemia in the Neonate. March 2020. https://www.starship.org.nz/guidelines/conjugated-hyperbilirubinaemia-in-the-neonate/

Stool Chart – Retrieved 31/03/20. https://www.childliverdisease.org/wp-content/uploads/2018/01/Yellow-Alert-Stool-Chart-Bookmark.pdf

Vitamin A – Retrieved from 31/03/20. https://www.pharmac.govt.nz/assets/form-alphatocopherylacetate-and-vitaminA.pdf

Vitamin E - Retrieved from 31/03/20. https://www.pharmac.govt.nz/assets/form-alphatocopherylacetate-and-vitaminA.pdf

Appendix A

First Line Investigations:

Test	Date Taken	Result
Full Blood Count and film		
Total **And conjugate bilirubin**		
Liver function tests - specify: **AST** **ALT** **GGT** **ALP**		
Blood Gas		
Albumin **Often low in preterm infants** (If assessing synthetic function, consider a coagulation screen)		
INR and / or full coagulation screen		
Blood groups and Coombs		
Liver ultrasound scan		
Ferritin		
Thyroid function tests		
a1 Antitrypsin phenotype		
Urine CMV		
Maternal / congenital infection (can be obtained from the obstetric record as necessary)	Maternal toxoplasma serology Maternal Syphilis status Maternal Rubella status Maternal Hepatitis B status	
Urine Sample	Bacterial culture Reducing substances	

Second Line Investigations:

Test	Date Taken	Result
Urine organic acids		
Urine amino acids		
Serum amino acids		
Plasma ammonia		
Plasma Lactate and Pyruvate		
Herpes simplex PCR (if clinically suspected)		

Other Investigations:

These should only be ordered after discussion with a specialist from the Paediatric Gastroenterology service and include:

Test	Date Taken	Result
Other acquired and congenital infections: Hepatitis A Virus IgM Adenovirus serology Epstein Barr Virus serology Stool Enterovirus (ECHO, coxsackie) Parvovirus PCR HHV6 PCR HCV (very uncommon cause in the initial perinatal period) HIV		
Triglycerides and Cholesterol		
Carnitine		
Urine bile acids (bile acid synthetic defects)		
Very long chain fatty acids (peroxisomal disorders)		
White Blood Cell enzymes or Bone Marrow aspirate (storage disorders)		
Karyotype		
HIDA scan		
Transferrin isoelectric focusing (congenital disorders of glycosylation)		

Mother (obtain maternal consent)

Test	Date Taken	Result
Antinuclear antibody		
HIV serology		

NB Wilson's disease has not been described in children <2 years.