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British Society of Paediatric Gastroenterology, Hepatology and Nutrition

Assessment, monitoring and management of deliberate and accidental paracetamol overdose in Children

Joint Guideline proposed by the Children's Specialised Liver Services at King's, Birmingham, and Leeds.

These guidelines are based on the consensus obtained at the 3-centre hepatology meeting in 2023.

Introduction

This document should be used in conjunction with TOXBASE guidelines on the initial assessment and management of paediatric patients presenting with intentional or accidental paracetamol overdose.

It does not replace the specialist advice from the Liver Unit and is only a general guidance. Any urgent clinical concerns should be discussed directly with the paediatric liver unit.

The background to the overdose should always be explored. Where intentional overdose has taken place, medical management should take place in parallel with mental health assessment using the mental health triage matrix tool and referral should be made to the CAMHS team. In infants or younger children with accidental overdose, please ensure advice has been given to parents on appropriate storage of medications with a follow-up with health visitor in the community. Safeguarding should be considered in all cases.

If there are any doubts about the management of a complex or unusual clinical presentation (eg paracetamol overdose in a neonate or IV paracetamol overdose),advice for each individual case should be sought from www.toxbase.org and the respective liver units.

Initial assessment and management of deliberate and accidental paracetamol overdose

We recommend the use of TOXBASE guidelines for the initial assessment and management of paracetamol overdose.

While initiating these guidelines, please refer to ***Table 1*** for red flags that warrant early discussion with one of the three paediatric liver units.

The initial management with N-acetylcysteine (NAC) can be either the standard 3 bag regime or the 2 bag SNAP (Scottish and Newcastle Acetylcysteine Protocol) regime.

Ongoing monitoring and management of deliberate and accidental overdose of paracetamol

At the end of the NAC regimen, all patients should have the following tests

- Liver function tests including bilirubin, AST, ALT and GGT
- Urea and electrolytes (U&Es)
- Clotting
- Venous blood gas including pH, bicarbonate, blood glucose and lactate

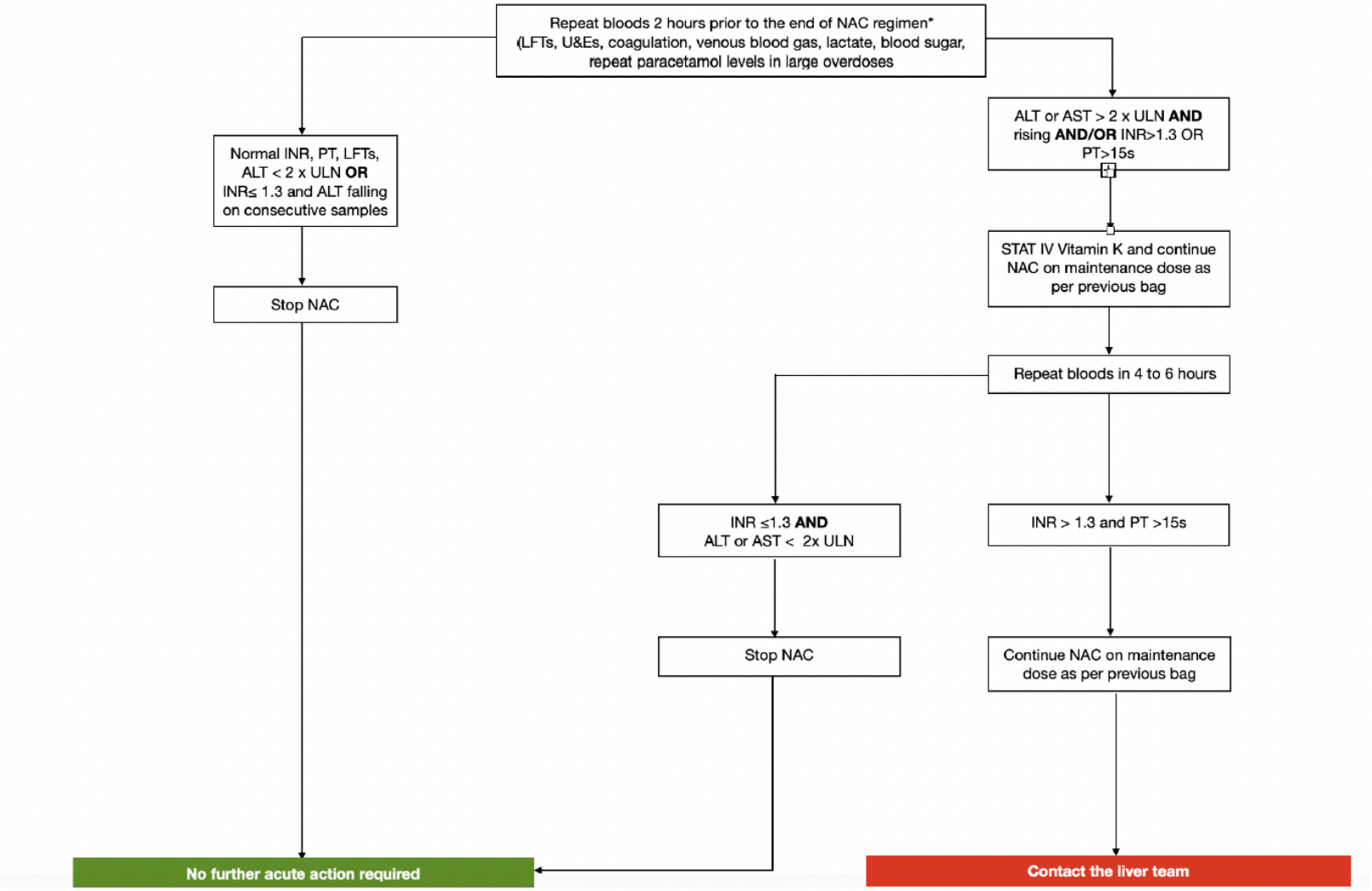
Depending on the results of these blood tests, we have highlighted our recommendations in ***Flowchart 1.***

If Child is in Acute Liver Failure, please follow the Acute Liver failure protocol in addition to continuing NAC. Refer to recommendations in ***Flowchart 1*** for guidance on discontinuation of NAC. Additional NAC infusions required after the 3 bag, or 2 bag regimes of the standard or SNAP protocol respectively can be 100 mg/kg over 16 hours.

Table 1- Criteria for early discussion with the liver centres

Acute Liver Failure defined as: • Prothrombin time (PT)≥15 seconds or international ratio (INR)≥1.5 not corrected by vitamin K in the presence of hepatic encephalopathy OR • PT≥20 or INR≥2.0 regardless of the presence or absence of clinical encephalopathy
pH < 7.3
AKI defined as: • Serum creatinine > 1.5 times the previous baseline or reference creatinine or upper limit of normal for the age • Urine out < 0.5 ml/kg/hour for 8 hours
Encephalopathy • Grade 1: irritable, behavioral and sleep disturbances, apathetic • Grade 2: Drowsy, confused but responds to commands • Grade 3: severely confused or agitated, but responds to pain • Grade 4: Unarousable, no response to pain
Hypoglycaemia (< 3.3 mmol/L)
Signs of hepatic necrosis: hepatic tenderness, jaundice
Persistently high lactate (Lactate > 2)
Intravenous paracetamol overdose
Paracetamol overdose in a neonate
Patients with previous Liver Transplant
Patients with chronic liver disease or other liver pathologies (known to the liver team)

Flowchart 1: Assessment and Management of Paracetamol Overdose after completion of initial NAC regimen



ALT- Alanine aminotransferase
AST- Aspartate aminotransferase
INR- International Normalised Ratio
IV- Intravenous
LFTs- Liver function tests
NAC- N-acetylcysteine
OD- Overdose
PT- Prothromin Ratio
U&Es- Urea and electrolytes
ULN- Upper Limit of Normal

* Irrespective of the 3-bag regimen or the Scottish and Newcastle Acetylcysteine Protocol (SNAP) 2-bag regimen

Indications to contact the Liver Unit

- Acute Liver Failure (ALF)- defined as:
  - Prothrombin time (PT) >/= 15 seconds or international normalised ratio (INR) >/= 1.5 not corrected by vitamin K in the presence of hepatic encephalopathy OR
  - PT >/= 20 or INR >/= 2.0 regardless of the presence or absence of clinical encephalopathy
- pH < 7.3
- Acute Kidney Injury- defined as: Serum creatinine > 1.5 times the previous baseline or reference creatinine or upper limit of normal for the age OR Urine output < 0.5 ml/kg/hour for 8 hours
- Encephalopathy
- Hypoglycaemia (< 3.3 mmol/L)
- Persistently high lactate (Lactate > 2)
- Patients with previous Liver Transplant
- Patients with chronic liver disease or other liver pathologies (known to the liver team)
- IV Paracetamol Overdose
- Paracetamol Overdose in Neonates

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