SNAP. Consensus statement on behalf of the BASL ALF SIG

SNAP or Scottish and Newcastle Acetylcysteine Protocol for the administration of n-acetyl-cystine (NAC) following admission to hospital with paracetamol overdose is a simplification of the BNF recommended standard infusion.

It was initially investigated as a way to reduce adverse effects associated with the loading dose of the standard protocol and to reduce the overall infusion time from 21 hours to 12 hours.

The loading dose of NAC in the standard regimen is associated with adverse effects such as nausea, vomiting and anaphylactoid reactions, that occur relatively commonly (1). The SNAP has been shown in a randomised controlled clinical trial to reduce the incidence of adverse reactions without exhibiting any increase in liver injury (2).

Formal non-inferiority comparison of the SNAP with the standard regimen have not been performed, due to the low event incidence of liver injury following paracetamol overdose. However, before and after studies have not found an increase in ALI or ALF following the introduction of the simplified protocol. Patients excluded from the analysis included those with significant liver injury at presentation (3).

The SNAP is actively being introduced throughout the UK following recent publication of the results of its use in 3 large hospitals in the UK (3). The protocol is supported by the RCEM and the infusion regimen is available on Toxbase for both adult and paediatric patients (4).

At present the use of NAC in the SNAP is unlicenced. The most recent statement from the MHRA from 2017 does not support the use of SNAP and the BNF still recommends the standard regimen. As a result, there is some disquiet amongst clinicians managing patients following paracetamol overdose. This relates to the possibility of patients being discharged at 12 hours and subsequently developing liver injury or liver failure. However, with the information available, there is little evidence of this happening.

A straw poll of liver transplant units in the UK has not revealed any increase in acute liver failure or acute liver injury following the widespread introduction of SNAP. The majority are supportive of it. The advantage is shorter hospital stay in those that can be safely discharged following the second infusion and a higher total NAC dose in those with adverse biochemistry requiring a third infusion (5).

If the SNAP is introduced in your hospital any adverse outcomes of the regimen should be reported via the yellow card process. The protocol should be followed and bloods following the second infusion at 12 hours need to be reviewed. A third infusion of 10 hours is indicated in any patient with an ALT greater than upper limit of normal or more than double the baseline ALT. If the INR increases by greater than 0.4 from baseline then the bloods should be repeated after 4-6 hours. A fourth infusion may be indicated in patients with an evolving acute liver injury (seek advice).

Caution should be shown in the utilisation of the SNAP with discharge at 12 hours in patient with massive overdose, those with delayed presentation, staggered overdose, mixed overdose with resultant delayed gastric emptying, such as seen with tricyclic antidepressants, or in those at disproportionate risk of hepatotoxicity including patients with anorexia and or low body mass index.

1. Sandilands EA, Bateman DN. Adverse reactions associated with acetylcysteine. Clin Toxicol. 2009 Feb;47(2):81–8.

2. Bateman DN, Dear JW, Thanacoody HKR, Thomas SHL, Eddleston M, Sandilands EA, et al. Reduction of adverse effects from intravenous acetylcysteine treatment for paracetamol poisoning: a randomised controlled trial. The Lancet. 2014 Feb;383(9918):697–704.

3. Pettie JM, Caparrotta TM, Hunter RW, Morrison EE, Wood DM, Dargan PI, et al. Safety and Efficacy of the SNAP 12-hour Acetylcysteine Regimen for the Treatment of Paracetamol Overdose. EClinicalMedicine. 2019 May;11:11–7.

4. RCEM Position Statement Use of the SNAP Regime for the Treatment of Paracetamol Toxicity [Internet]. 2021. Available from: https://rcem.ac.uk/wp-content/uploads/2021/11/Use_of_SNAP_for_Treatment_of_Paracetamol_Toxicity_Nov_2021.pdf

5. Motohashi K, Thanacoody RH. Toxicology in the emergency department: what's new? Br J Hosp Med. 2022. https://doi.org/10.12968/hmed.2022.0313