3:16 Refeeding Syndrome

(FOR REFEEDING IN EATING DISORDERS PLEASE REFER TO SECTION 3.15 OF NHSGGC MENTAL HEALTH FOOD, FLUID & NUTRITIONAL MANUAL)

Definition

Patients who are nutritionally compromised on admission to Mental Health inpatient wards may be at risk of Refeeding Syndrome.

Re-feeding problems encompass life-threatening acute micronutrient deficiencies, fluid and electrolyte imbalance, and disturbances of organ function and metabolic regulation that may result from over rapid or unbalanced nutrition support.

The problems arise because starvation causes adaptive reductions in cellular activity and organ function accompanied by micronutrient, mineral and electrolyte deficiencies. Abnormalities in malnourished individuals may therefore include:

- Deficiencies of vitamins and trace elements.
- Whole body depletion of potassium, magnesium and phosphate.
- Increased intracellular and whole-body sodium and water.
- Low insulin levels and a partial switch from carbohydrate metabolism to ketone metabolism to provide energy.
- Impaired cardiac and renal reserve with decreased ability to excrete an excess salt and water load.
- Abnormalities of liver function.

Giving nutrients and fluid to malnourished patients will reverse these changes but in doing so leads to an increase in demands for electrolytes and micronutrients, and a simultaneous shift of sodium and water out of the cells. Over rapid or unbalanced nutrition support can therefore precipitate acute micronutrient deficiencies and dangerous changes in fluid and electrolyte balance.

Enteral tube feeding or parenteral feeding can precipitate re-feeding problems since excessive feeding levels can be achieved easily. The problem can also be exacerbated if the products do not include adequate vitamins, phosphate or electrolytes.

The two widely recognized problems of re-feeding are those of classical “Re-feeding Syndrome” and the “Wernicke Korsakoff Syndrome” Since the nature of re-feeding precludes randomised trials of treatment, recommendations are derived from expert opinion.

Classical Re-feeding Syndrome - Clinical Description

Re-feeding syndrome occurs on feeding when a range of life threatening clinical and biochemical abnormalities arise:

- Cardiac failure, pulmonary oedema and dysrhythmias.
- Acute circulatory fluid overload or circulatory fluid depletion.
- Hypophosphataemia.
- Hypokalamia.
- Hypomagnesaemia and occasionally hypocalcaemia.
- Hyperglycaemia.

Wernike-Korsakoff Syndrome- Clinical Description

This is caused by acute thiamine deficiency when re-feeding of malnourished patients precipitates increased thiamine demand as starving cells switch back to carbohydrate metabolism. It is seen particularly in alcoholics who may have low liver stores of thiamine. It can also occur in any patient with chronic vomiting including those with gastric outlet obstruction and hyperemesis gravidarum.

Refeeding Syndrome in Mental Health Inpatient Services

In Mental Health Inpatient wards, patients may present with both physical and mental health complications that may increase their refeeding risk. Patients with an eating disorder may be at particular risk (See section 3.15), however refeeding risk may occur with other patients. In particular, patients who are malnourished and / or have alcohol dependency have been shown to have a high risk of refeeding syndrome on commencement of alcohol detoxification and reintroducing food intake. Criteria for assessment of risk are shown below.

Assessing risk and clinical management of refeeding syndrome in Mental Health (Non Eating Disorders):

People at high risk of developing re-feeding problems (Box 1), should be cared for by healthcare professionals who are appropriately skilled and trained and have expert knowledge of nutritional requirements and nutrition support. Refer to the NST, Advice should be sought from appropriate acute medical and laboratory staff if required.

Box 1: Criteria for determining patients at risk of re-feeding syndrome

Patients at risk of re-feeding syndrome if one or more of the following:-

BMI less than 16kg/ m^2
Unintentional weight loss greater than 15% within the last 3-6 months.
Little or no nutritional intake for more than 10 days.
Low levels of potassium, phosphate or magnesium prior to feeding.

OR

Patient has two or more of the following:-

BMI less than 18.5kg/ m^2
Unintentional weight loss greater than 10% within the last 3-6 months
Little or no nutritional intake for more than 5 days
A history of alcohol abuse or drugs including insulin, chemotherapy, antacids or diuretics

Adapted from NICE (2006)

The general prescription for people at high risk of developing re-feeding problems should consider: (following advice from NST, Medical and Laboratory staff as required)

- Starting nutrition support at a maximum of 10kcal/kg/day, increasing levels slowly to meet or exceed full needs by 4–7 days.

- Using only 5 kcal/kg/day in extreme cases (e.g. BMI less than 14 kg/ m^2 or negligible intake for more than 15 days) and monitoring cardiac rhythm continually in these people and any others who already have or develop any cardiac arrythmias.
- Restoring circulatory volume and monitoring fluid balance and overall clinical status closely.

Prescribing immediately before and during the first 10 days of feeding as follows:

- Oral thiamine 100mg three times daily, or
- Intravenous Pabrinex 1 pair once daily for 3 days if GI absorption is compromised. If there is history of alcohol excess refer to GGC Adult Therapeutics Handbook on 'Management of Alcohol Withdrawal Syndrome'
- NB: Due to the lack of evidence, no firm recommendation can be made as to how effective thiamine is in the prevention or treatment of re-feeding. (Cochrane Review updated 2008: Day et al 2004)

- A balanced multivitamin/trace element supplement once daily may be beneficial (patients on PN will receive this as part of the PN

formulation).

- Oral, enteral or intravenous supplements of potassium, phosphate and magnesium. It is likely patient requirements will be above normal maintenance requirements. Measured serum levels may help guide supplementation and guidance on replacement may be found in the NHS GGC Adult Therapeutic Handbook but please remember that levels may fall again after supplementation as electrolytes redistribute from the extracellular to intracellular compartments. Ensuring low Magnesium levels are replaced is particularly important in patients at risk of thiamine deficiency. Pre-feeding correction of low plasma levels is unnecessary but additional supplements maybe required above what is contained in EN or PN formulations. Discuss with NST if necessary.

Whilst the rate of feeding may need to be adjusted as above, full requirements of fluid, electrolytes, vitamins and minerals should be provided from the outset of feeding, Feeding should rarely be withheld because a patient is felt to be at risk of re-feeding syndrome.

Recommendations for clinical practice

Nutrition support should be cautiously introduced in seriously ill or injured individuals requiring enteral tube feeding or parenteral nutrition. It should be commenced at no more than 50% of the estimated target energy and protein requirements. It should be gradually increased to meet the full needs over the first 24–48 hours according to metabolic and gastrointestinal tolerance. Full requirements of fluid, electrolytes, vitamins and minerals should be provided from onset of feeding. NICE (2006). If a patient is at high risk of re-feeding syndrome but no indication for Enteral Feeding then consult the mental health dietitian for a meal plan. Daily bloods required as above.

In the absence of a mental health dietitian (e.g. over a weekend) then food fluid and record charts should be commenced to monitor intake, and diet maintained either at current level if eating and drinking well prior to admission, or, no more than ½ portions at each meal time initially, if dietary intake was thought to be inadequate at home. Encourage fluids such as water, no added sugar diluting squash or tea/coffee without sugar. No extra snacks in between meals or nutritional drinks such as those milk based or high in sugar. Please do not prescribe Oral Nutritional Supplements prior to dietetic assessment.
Prior to an Enteral Feed commencing note:

- Contact the local Mental Health Dietitian for support and feeding plan
- Most wards have a feeding pump if required; feed and ancillaries

Not all settings in Mental Health services have immediate access to these therefore please give consideration to this prior to recommending feeding.

- Any required training **Nutricia Clinical Care** will provide training for the Enteral Feed Pump. Please contact the main telephone number on **01225 711688 for local nurse support information**.
- Contacting the NHS GGC Community Home Enteral Feeding Team Nurse and Dietitian for passing NG tube and for further support.
- Monitoring Daily bloods (U's & E's, Bone profile, Mg and glucose) for ten days and correct where necessary paying particular attention to the re-feeding markers such as Potassium, adjusted Calcium, Phosphate, Mg and Glucose (see NHSGGC acute guidance)