Workshop: MARSIPAN: Management of Really Sick Patients with Anorexia Nervosa

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MARSIPAN

- MARSIPAN
- Junior
- Checklist
- MDT gp experts
- evidence and consensus
Talk

- Brief overview of MARSIPAN’s and background
- Evidence post MARSIPAN
- The “how to” of MARSIPAN in terms of nutrition and Dietetics
- Case study and questions
Remit of MARSIPAN

- risk assessment, physical examination and associated action
- location of care and transition between services
- compulsory treatment
- admission and local protocols
- management of refeeding
- management of compensatory behaviours associated with an eating disorder
- management in primary care and outpatient settings
- discharge
Calorie needs

Predictive equations not accurate at <BMI 16. Starvation reduces metabolism by up to 40%.

Calorie needs

Weight gain is made more difficult by the increase in energy expenditure (EE) during refeeding: resting EE, which is low during starving, increases by 10% soon after the start of refeeding. This was also true for the diet-induced thermogenesis, which was shown to rise by as high than 40% (hypermetabolism).


Calorie Needs

For weight gain of 0.5-1kg a week some individuals may need in excess of 1000 extra calories a day this can be obtained through:

- extra snacks
- increased portions
- sip feeds

Supplementary NG feeding (Rigaud, 2007) * strong evidence
GI function and patient preference should be considered.

Least restrictive option

- Legally in UK evidence that least restrictive options have been tried and failed e.g. food of an adequate calorie intake and minimally safe (not optimal) balance.

- If meals are not completed, make up lost calories with nutritionally complete 2 kcal/ml sip-feeds (Ensure® TwoCal, Fortisip® Compact). Not juice style or energy mixes.

- These may form the predominant intake initially or be used to meet full nutritional requirements at the outset to avoid a nasogastric tube insertion.

- If the child is unable to meet the prescribed calorie intake within 24 h of commencing the meal plan then a nasogastric tube insertion should be considered, balancing the level of risk and the wishes of the child and parents. (Adults it is clinical judgement)
Glycogen and fluid

- Up to 5kg
- Rapid regains after CHO restriction or VLCD
- Muscle glycogen can be depleted to about one-third normal with low-carbohydrate diet for 3 d. After a high-carbohydrate diet the glycogen stored rose six fold higher, to more than twice normal.

Refeeding

- reintroduction of nutrition elicits an insulin surge in response to increased serum glucose.
- Insulin triggers tissue receptors to increase the uptake of serum glucose, resulting in an increased intracellular movement of glucose, phosphate, potassium, and magnesium, resulting in a drop in serum levels.
- glucose is utilized as the main energy source causing a dramatic switch from ketone to glucose metabolism and the start of a cataclysmic biochemical event, the refeeding syndrome.
The evidence supports:

- In mildly and moderately malnourished patients, lower calorie feeding is too conservative
- Higher calorie refeeding has not been associated with increased risk or the refeeding syndrome under close medical monitoring with electrolyte correction
- Both meal-based approaches or combined nasogastric+meals can administer higher calories
- In severely malnourished inpatients there is sufficient evidence to change the current standard of care?

Meal plans

A safe meal plan will be devised and agreed with the team and the family to form the basis of a clear treatment plan, minimising communication errors and avoiding discussions around anorexic preoccupations and concerns at the time of a meal or snack.

It is important to consult parents when drawing up a meal plan, so that the family’s usual diet can be accommodated as much as possible (including special diets in various ethnic groups).

What works reasonably well is agreeing with the child three to five things they dislike, generally foods they also did not eat before developing an eating disorder.

Snack exchange list
Composition - CHO

CHO of feed

- Via supp of fat emulsion to reduce the glucose load /insulin surge that elicits refeeding syndrome.
- Difficult to estimate ideal carbohydrate content of a feed
- Gradual release of insulin by limiting the glucose load will aid the inhibition of adipose tissue breakdown, which was being metabolized to form ketones, further supporting the gradual switch from ketone to glucose metabolism during this refeeding stage

O’Connor G refeeding and glucose load ( )
Composition

Sodium feed

- low-sodium (1,600–2,000 mg) vs normal-sodium diet (4,000–4,800 mg) in a non-randomized study in severely malnourished adult AN.
- Weight gain and peripheral oedema were greater on the normal diet
- Reducing the sodium content of the refeeding diet may be useful in managing fluid shifts, especially in adults with a BMI<15 kg/m².
- In almost all patients, BMI plateaued around 15–16 kg/m², then increased again. At plateau, an increase in intracellular water and in “active FFM” together with a similar decrease in extracellular water.

Forbes et al. (1984) compared diets beginning at higher caloric levels but with lower and higher protein contents (10 vs. 20% of calories from protein) among 12 patients with AN. 

- no difference in rate of overall weight gain, lean mass, or REE and concluded that a high protein diet does not benefit body composition during refeeding.
Composition

Omega 3?

Mauler et al. (2009) performed a controlled (but not randomized) study in 25 participants with AN comparing a diet higher in omega-3 to a diet with an equal proportion of calories from saturated fat. No differences in weight gain or serum leptin concentrations were observed, lending no support to the hypothesis that high Omega-3 diets may produce greater weight gain through attenuated leptin levels.

However, may have other beneficial effects.

Refeeding rate

Rate

Recent evidence for refeeding rates and routes suggest commence refeeding at 30/40Kcals /kg in adolescent populations unless there is a clinical rationale to feed more slowly e.g. pre-existing electrolyte or renal abnormalities or comorbidity increasing the risk of re-feeding syndrome, such as significant infection.

(O’Connor 2016, Garber 2015, Parker 2016, Madden 2015).

More studies are needed in adult and enduring populations
Refeeding-supplementation

Mg2+,Po-

The use prophylactic supplementation of thiamine, and phosphate to support refeeding, in conjunction with close monitoring and correction of phosphate, magnesium, calcium and potassium, body weight and glucose during the first 10-14 days of refeeding (Garber 2015).
In adults, it is standard practice to prescribe thiamine replacement and a vitamin and mineral supplement. Practice with young people is more variable, and again the evidence base is limited.

Prescribing a complete multivitamin and mineral supplement (e.g. Forceval®) is logical and carries minimal risk.

Phosphate and magnesium supplements are necessary if the level of either falls significantly.

For older adolescents, following adult guidelines on prescription of thiamine is justifiable. As there is no evidence to support any specific age when adult guidelines should be followed in adolescents, it is a judgement call of the clinician based.
Refeeding recommendations
( O’Connor 2016)

- Refeeding malnourished adolescents with AN at 1200kcal/ day (30-40kcal/ kg) elicits greater weight gain and had no adverse effect on cardiac function.

- No association between energy intake or carbohydrate intake was linked to refeeding hypophosphatemia.

- Patients that are very low weight <70%BMI may be at increased risk of developing refeeding hypophosphatemia.

- Patients that have low WBC’s <3.8 x 10⁹/L may be at increased risk of developing refeeding hypophosphatemia (caveat raised CRP).

- Patients at higher risk of refeeding complications should commence prophylactic phosphate at 2-3mmol/ kg (phosphate sandoz =16mmol)
Summary

Energy requirements for weight restoration/growth and maintenance of body weight vary greatly between individuals, so an individualised approach to diet and weight restoration should be implemented using the least restrictive feeding option where it is safe to do so; offering oral diet and sip feeding before enteral feeding.
Bolus feeding under restraint

2-3 x day e.g. 800-1000ml a bolus, a 800-1000 ml bolus can be given in approximately 15-20 minutes via syringe.

- Nutricia Infinity 600ml/h
- Applix/Amika 600ml/h
- Fresenius Kabi 600ml/h
- Kangaroo 500ml/h

Oliver Street & Sarah Fuller: In-patient treatment of Young People with Anorexia Nervosa: A survey of common practice in enteral feeding when physical interventions are required.
When prescribing large volume feeds, e.g. 2 x 800-1000 ml boluses to fully assess the medical stability consider:

- 24 hour urine output
- Blood sugar levels
- Biochemistry
Feeding Route - bolus

On a small total volume of fluids, i.e. less than 1800 ml/day check

- signs of a poor urine output, pre-existing medical condition,
- signs of clinical dehydration and or constipation.

- weekly liver function tests (especially to monitor the ALT levels) to identify if there is any emerging fatty liver profile. Persistently raised ALTs would indicate further investigation and a liver ultrasound

Oliver Street & Sarah Fuller: In-patient treatment of Young People with Anorexia Nervosa: A survey of common practice in enteral feeding when physical interventions are required CNN Magazine
Summary

More research is needed in non-hospital settings

The long-term impact of different approaches is unknown
Monitoring

Observation at meal times (i.e. who is present at each snack and meal time and who has the responsibility for observation and documentation of the food and fluid that is consumed) and the length of snack and meal times (e.g. 15 minutes per snack and 30 minutes per meal) need to be agreed and documented.

Any actions to be taken if a meal is not completed (e.g. a volume of bolus feed to be given instead of the completed meal) need to be agreed and documented in advance. Individual circumstances will help to dictate the exact needs of the person and any assistance that may be needed with respect to helping them eat the required amount of food.
Weighing

Weighing in the same way and at the same time of day will help to minimise fluctuations in weight from non-nutritional reasons.

same scales, in the morning before breakfast and after emptying the bladder, in underclothes only (bearing in mind that items can be hidden in these).

Water-loading that mimics weight gain needs to be considered. This may need restriction of access to fluids such as other patients’ drinks, taps, toilets and showers.

If there is ongoing concern, measurement of the specific gravity of the urine may be necessary when the individual is weighted.

Access to the ward scales may need to be restricted to decrease the likelihood of frequent weighing by the individual.
Rate of weight gain

- No weight gain during first 4 weeks predicts poorer outcomes
- Rapid weight gain in first 6-8 weeks accurately predicts early discharge (local research Campbell – Leeds)

Weight gain predictions

Quicker weight gain/less calories needed
- Genetics - family overweight
- Recent rapid weight loss
- SEAN - adaptation to less calories
- Hx of overweight (Number of fat cells (birth weight, 2 years, puberty)
- Hx of weight cycling

Slower weight gain/more calories needed
- Family thin
- Slower gradual weight loss
- Recent Hx of low eight for significant period e.g. <6 months
- Low weight during childhood, 2 years, puberty etc
Managing weight manipulation

- If weight gain is less than expected (>0.5–1.0 kg/week), assume weight-losing behaviours. These are an inevitable part of the illness, and punitive responses should be avoided. If sudden significant unexpected changes in weight are observed (e.g. 2 kg within a few days), assume water-loading and other fluid manipulations.

- Meeting of key staff responsible for treatment (paediatrician/consultant, nursing staff, child and adolescent eating disorders psychiatrist or liaison psychiatrist, other staff involved in liaison care)

- Involve (usually) the parent/carer and (usually) the person in discussions about the treatment plan. If parents or the person are not involved (e.g. too unwell to attend), document the reasons for this.

- Establish the level of nursing supervision needed. When possible, employ a nurse from the specialised eating disorder service to supervise and train nurses caring for these patients.
Supported Nutrition

Eating + wt gain distressing – physically and psychologically

Delayed gastric emptying + impaired gut motility = consumption of large amounts uncomfortable


Intense dread of wt gain + loss of control of identity = emotional support to eat required
Returning to a healthy weight

- Usually 10% higher weight than previous
- Increased % fat
- More central adiposity
- 1 year later return to normal distribution

Psycho-education

- e.g. the body is not a maths equation!
- Glycogen and fluid vs flesh weight change
- Behavioural experiments
- Weight regulation and weight loss physiology
- Self monitoring
Case study

Miss R
Rapid weight loss < 20kg in 6 months
BMI 13
WCC low
LFT’s increasing
Minimal oral intake < 500 calories and losing wt
Case study 2

Mr W

Steady slow weight loss over past year

BMI 12

No CHO for past 3 months

Exercises++

WCC higher than normal & slightly raised temp

Bloods normal