MALNUTRITION IN HOSPITAL

By Geoffrey Axiak
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St. Luke’s Hospital
Malnutrition is the condition that develops when the body does not get the right amount of the vitamins, minerals and other nutrients it needs to maintain healthy tissues and organ function (Fyke, 2003).

- It occurs in people who are either undernourished (e.g. P.E.M.) or over-nourished (e.g. obesity).
The World Health Organisation (W.H.O.) defines malnutrition as “the cellular imbalance between the supply of nutrients and energy and the body’s demand for them to ensure growth, maintenance and specific functions”.

Malnutrition can encompass a wide range of deficiencies (e.g. protein-energy) and excesses (e.g. obesity). However, one area – undernutrition – has emerged as a priority area (Reuben et al., 1995).
Stress, e.g. infection/trauma

PEM (Kwashiorkor)
Absolute deficit in protein but energy intake relatively adequate (esp. Carbohydrate)
Increased insulin: cortisol ratio
Increased mobilisation of skeletal muscle and subcutaneous fat
Albumin levels fall quickly
Oedema: moon-faced

PEM (Marasmus)
Absolute deficit in protein and energy
Decreased insulin: cortisol ratio
Decreased mobilisation of skeletal muscle and subcutaneous fat
Wasting
Albumin levels fall slowly

Pathogenesis of malnutrition
Causes of malnutrition

- Poverty
- Inadequate food intake
- Chronic disease / illness
- Old age
- Decreased absorption
- Abnormal metabolism
- Hospitalisation
On the 5th December 2001, the BBC issued front-page news: *Hospital Patients – ‘Malnourished on Arrival’*. “An incidence of one patient in every five admitted to hospital in the UK was found to be malnourished, and this [they say] may be an underestimate of the true scale of the problem” (BBC, 2000).
Malnutrition in hospital is a well-documented and significant problem and contributes to increased recovery times, length of stays, cost to the health services and patient mortality and morbidity.

Malnutrition in hospital - 3

- P.E.M. in hospitalised patients is usually due to:
  - Difficulties with chewing, swallowing, digesting food, pain, nausea and lack of appetite.
  - Nutrient loss can be accelerated by bleeding, diarrhoea, malabsorption disorders and other factors.
  - Fever, infection, surgery, trauma, burns and some medications and benign or malignant tumours increase the amount of nutrients needed by patients.
  - Severe sepsis, inflammatory disease and surgery switch on inflammatory mediators whose job is to mobilise muscle tissue to provide amino acids for an effective acute-phase response.
A Case In Point: Malta

- In Malta a 40% incidence of malnutrition was identified in patients undergoing renal dialysis on a regular basis (HD or CAPD) (Axiak, 2003). None were referred for nutritional assessment and help.

- Only 2-3% of ward patients are referred to the Clinical Nutrition Services (St. Luke’s Hospital) for treatment of malnutrition (Clinical Nutrition Services Statistics, Malta, 2003).
The vicious circle of malnutrition in hospital

- Nutritional status that gets more precarious
- Increased length of stay and decreased access to services
- Increased morbidity and increased major complications
- Prolongation / aggravation of malnutrition
- Increased mortality
- Increase in care prolongation
- Unplanned readmission
- Return to compromised home food supply
- Increased length of stay and decreased access to services
- Increased morbidity and increased major complications
- The vicious circle of malnutrition
Numerous research studies have documented the inability of many health care providers to identify nutritional deficit vulnerability and early and advanced malnutrition status (Ennis et al., 2001). This sets chronically ill patients on a carousel of morbidity (Ward, 2001).

Rollins (2002) mentions a frequency of 70% of malnutrition that is unrecognised in hospital outpatients.
Reasons for under-recognition of malnutrition in hospitals

- While healthcare staff regularly monitor patients for adverse changes in respiratory function, fluid and electrolyte balance, the effects of starvation or semi-starvation often go unrecognised.

Causes of malnutrition in the elderly

- Restricted resources for purchasing and storing food
- Poor dental status
- Social isolation
- Depression and bereavement
- Stomach problems & indigestion, malabsorption
- Pain / immobility
Causes of malnutrition in the elderly - 2

- Medications causing anorexia
- Sensory defects
- Respiratory disease - causing hyperventilation & increased energy requirements
- Carcinoma of the oesophagus, pharynx and gut - may constitute mechanical obstructions to intake of food
- Dietary compliance problems
Pnemonic for Treatable Causes of Malnutrition (Morley & Silver, 1995) – MEALS ON WHEELS

- Medication
- Emotional problems (depression)
- Anorexia
- Late-life paranoia
- Swallowing disorders
- Oral factors
- No money
Pnemonic for Treatable Causes of Malnutrition (Morley & Silver, 1995) – 2

[MEALS ON WHEELS]

- Wandering & other dementia-related behaviour
- Hypertension, hyperthyroidism, hypoadrenalism
- Enteric problems (malabsorption)
- Eating problems (inability to feed oneself)
- Low-salt, low-cholesterol
- Social problems (ethnic food preferences, isolation)
### Signs associated with malnutrition - 1

<table>
<thead>
<tr>
<th>Body Area</th>
<th>Signs Associated With Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hair</strong></td>
<td>Lack of natural shine; dull, dry, sparse, straight, colour changes (flag sign); easily plucked</td>
</tr>
<tr>
<td><strong>Face</strong></td>
<td>Dark skin over cheeks and under eyes (malar and supraorbital pigmentation), scaling of skin around nostrils (nasolabial seborrhea) Oedematous face (moon face) Colour loss (pallor)</td>
</tr>
<tr>
<td><strong>Eyes</strong></td>
<td>Pale conjunctivae Bitot’s spots, conjunctival and corneal xerosis, soft cornea Redness and fissuring of eyelid corners</td>
</tr>
<tr>
<td><strong>Lips</strong></td>
<td>Redness and swelling of mouth or lips, angular fissure and scars</td>
</tr>
<tr>
<td><strong>Tongue</strong></td>
<td>Red, raw and fissured, swollen Magenta colour Pale, atrophic Filiform papillary atrophy</td>
</tr>
</tbody>
</table>
Signs associated with malnutrition - 2

<table>
<thead>
<tr>
<th>Teeth</th>
<th>Carious or missing</th>
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<tbody>
<tr>
<td></td>
<td>Mottled enamel (fluorosis)</td>
</tr>
<tr>
<td>Gums</td>
<td>Spongy, bleeding, may be receded</td>
</tr>
<tr>
<td>Glands</td>
<td>Thyroid enlargement</td>
</tr>
<tr>
<td></td>
<td>Parotid enlargement</td>
</tr>
<tr>
<td>Skin</td>
<td>Follicular hyperkeratosis, dryness with flaking</td>
</tr>
<tr>
<td></td>
<td>Hyperpigmentation</td>
</tr>
<tr>
<td></td>
<td>Petechiae</td>
</tr>
<tr>
<td></td>
<td>Pellagrous dermatitis</td>
</tr>
<tr>
<td></td>
<td>Scrotal and vulval dermatitisos</td>
</tr>
<tr>
<td>Nails</td>
<td>Spoon nails, brittle or ridged</td>
</tr>
</tbody>
</table>
### Signs associated with malnutrition - 3

<table>
<thead>
<tr>
<th>Muscular and skeletal systems</th>
<th>Muscle wasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal and parietal bossing; epiphyseal swelling; soft, thin infant skull bones, persistently open anterior fontanelle; knock-knees or bow-legs</td>
<td></td>
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<tr>
<td>Beading of ribs</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal systems</th>
<th></th>
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<tbody>
<tr>
<td>Gastrointestinal</td>
<td>Hepatomegaly</td>
</tr>
<tr>
<td>Nervous</td>
<td>Mental confusion and irritability</td>
</tr>
<tr>
<td></td>
<td>Sensory loss, motor weakness, loss of position sense, loss of vibration, loss of ankle and knee jerks, calf tenderness</td>
</tr>
<tr>
<td>Cardiac</td>
<td>Cardiac enlargement, tachycardia</td>
</tr>
</tbody>
</table>
Diagnosing malnutrition

- **Anthropometric measures**
  - Weight, height, BMI, skinfold thickness, calf & mid-arm circumference, waist-to-hip ratio

- **Dietary analysis**
  - Dietary history, recall methods, food diary

- **Laboratory studies**
  - Se. albumin, se. transferrin, retinol-binding protein, prealbumin, ? se. potassium
Consequences of malnutrition

- Reduced renal function
- Impaired wound healing
- Constipation, diarrhoea, pain
- Respiratory failure
- Skeletal muscle atrophy
- Increased length of stay
- Surgery stress, increased metabolic rate
- Reddish hair, atrophy of tongue papillae
The spiral of events in malnutrition

- Normally nourished
- Precipitating cause of malnutrition
  - Apathy
  - Reduced food intake
  - Weakness & misery
  - Depression
  - Depressed organ function
  - Infection
  - Decompensated organ failure

- Anorexia
- Death
Treatment of malnutrition

- Sip feeds / bars / yoghurt-like cans
- Enteral feeding
  - via N.G. / N.J. / P.E.G. / Gastrostomy tube
- Parenteral feeding
  - via central line
- Special parenteral feeding e.g. intradialytic TPN

✓ advantages & disadvantages exist!
Screening for malnutrition

- As Sakla (2001) states “screening identifies at-risk patients who require more thorough assessment, which involves a careful medical history and physical examination as well as anthropometric and laboratory measurements”.

- **Education programmes** help increase understanding about choosing food.

- Governments should develop **policies**.
The Situation In Malta

- No full-time dieticians available at the moment.
- No screening service is available.
- Malnutrition is treated only in 2-3% of cases.
- No teaching at Medical School about Clinical Nutrition.
- Few lectures in Nursing curricula but very little about Healthy ‘Nutrition’ as such. Few lectures on Clinical Nutrition, i.e. artificial feeding (e.g. nasogastric, P.E.G., gastrostomy, T.P.N.).
- Almost no research in this area.
The key to early detection is awareness that the persons in certain circumstances have a high risk of malnutrition. Prevention of malnutrition, especially via regular screening is the answer, or rather, the best way to treat malnutrition.”
Thank you!
Body Mass Index (BMI)

<table>
<thead>
<tr>
<th>Weight/Height²</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>&lt;18.5</td>
<td>underweight</td>
</tr>
<tr>
<td>18.5-25</td>
<td>normal</td>
</tr>
<tr>
<td>25-30</td>
<td>overweight 1</td>
</tr>
<tr>
<td>30-35</td>
<td>obese 1</td>
</tr>
<tr>
<td>&gt;35</td>
<td>obese 2</td>
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</tbody>
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