Implementation of high quality care

Hydration and Malnutrition

Prof Martin Dennis
University of Edinburgh
Outline

• What is high quality care?
• Importance of hydration and nutrition in hospitalised stroke patients
  • Methods of assessment
  • Frequency of dehydration and malnutrition
  • Associations with outcomes
• Evidence supporting interventions aimed at improving hydration and nutrition
• Implementation of strategies to improve hydration and nutrition
What is high quality care?

• Optimise the patient’s chances of achieving their goals
• Effective
• Acceptable
• Consistently delivered
Assessment

- Objectives of care – survival or palliation
- Swallowing – will define whether oral route is safe
- Hydration – will determine fluid needs
- Nutrition – will determine nutritional needs
Objectives of care
Swallow assessment

Bedside swallow screen

Fiberoptic Endoscopic Evaluation of Swallow (FEES)

Video fluoroscopy

Royal College of Speech & Language Therapists
Unsafe swallow

• Maybe 50% of admitted patients
  • Depends on casemix
    • Age
    • Severity
    • Timing

• Leads on to consideration of how to
  • maintain hydration
  • feed
  • give important medications

• Associated with worse outcomes (not surprisingly!)
Hydration assessment

Clinical

USG Refractometry

Fluid charts

Urea:Creat Ratio

Urine colour

Urine Specific Gravity USG)
The frequency of dehydration amongst hospitalised acute stroke patients
(2454 patients with 16638 measures of urea/creat ratio)

<table>
<thead>
<tr>
<th>Range of hospital admission days</th>
<th>Hydrated [≤60 mmol:mmol]</th>
<th>Boderline hydrated [60.01-80 mmol:mmol]</th>
<th>Dehydrated [&gt;80 mmol:mmol]</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>0-24</td>
<td>2240 22</td>
<td>3210 31</td>
<td>4753 47</td>
<td>10203</td>
</tr>
<tr>
<td>25-49</td>
<td>572 19</td>
<td>762 25</td>
<td>1706 56</td>
<td>3040</td>
</tr>
<tr>
<td>50+</td>
<td>665 20</td>
<td>963 28</td>
<td>1767 52</td>
<td>3395</td>
</tr>
<tr>
<td>All</td>
<td>3477 21</td>
<td>4935 30</td>
<td>8226 49</td>
<td>16638</td>
</tr>
</tbody>
</table>

Tom Walsh; Anne Rowat; Cat Graham; Martin Dennis.
Nutritional assessment

End of bed

Weight

BMI

‘MUST’ Tool

Step 1
BMI kg/m²
>20 (>30 Obese) = 0
18.5–20 = 1
<18.5 = 2

Step 2
Unplanned weight loss in past 3-6 months
%
<5 = 0
5-10 = 1

Step 3
If patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days
Score 2

Step 4
Overall risk of malnutrition

Add scores together to calculate overall risk of malnutrition
Score 0 Low Risk
Score 1 Medium Risk
Score 2 or more High Risk

- 0 Low Risk
  - Routine clinical care
  - Ensure appropriate food and drink choices
  - Repeat screening every 3-6 months, unless there is clinical concern
  - Document action taken

- 1 Medium Risk
  - Observe
  - Follow ‘MUST’ 1 care pathway on page 10 of Guidelines Booklet
  - Re-weigh weekly
  - Document action taken
  - Unless detrimental or no benefit is expected from nutritional support e.g. end of life care pathway

- 2 or more High Risk
  - Treat
  - Follow action plan for medium risk
  - Refer to Dietitian

This tool is to assist your assessment. If in doubt, use your professional judgement
Difficulties with Nutritional assessment

- Communication limits history
- Often living alone
- Difficult to weigh
- Difficult to measure height
- Lack of expertise in anthropometry
- Lack of agreement on methods
A weight chart
Under nutrition

• Under-nutrition common among stroke patients
  • estimates vary from 8 to 34%
• Nutritional status often deteriorates during admission
• Nutritional status is an independent predictor of survival
Nutrition after stroke is important

FOOD Trial data

Undernourished vs Normal - Survival

Crude Odds Ratio = 2.3 (95% CI 1.8 to 3.0)

*Adjusted Odds Ratio = 1.8 (95% CI 1.3 to 2.5)

(* age, pre-stroke function, living circumstances, stroke severity & swallowing)
Other assessments relevant to hydration and nutrition

- Conscious level
- Postural control
- Language
- Arm & hand function
- Facial weakness
- Teeth
Effectiveness of assessments

• No robust evidence from RCTs of the benefits of these assessments
• Consensus that they are a good thing
• Recommended by guidelines
What are high quality interventions?
Simple Interventions

- Position patients at mealtimes
- Regularly offer fluids
- Appetising food of suitable type and consistency
- Place in reach and in sight of patients
- Mouthcare
- Teeth
- Treat medical complications
  - candida
Interventions aimed at improving swallowing

- Manoeuvres taught by speech & language therapists
- Acupuncture
- Devices (palatal loops, electrical stimulation)
- Medications (e.g. metoclopramide)

There was some evidence that acupuncture and behavioural interventions may reduce dysphagia.

The roles of drug therapy, neuromuscular electrical stimulation, pharyngeal electrical stimulation, physical stimulation, transcranial direct current stimulation, and transcranial magnetic stimulation remain unclear.

(Geeganage et al, 2012)
Interventions aimed at improving hydration

• Parenteral fluids
• Enteral fluids

We found no evidence to guide the best volume, duration, or mode of parenteral fluid delivery for people with acute stroke.”

(Visvanathan et al 2015)
Interventions aimed at improving nutrition

• Oral supplements

The available trial evidence does not support the routine use of protein and energy supplements in acute stroke patients who are able to take food by mouth.

Supplements may show benefit in those who have signs of malnutrition, for example through reducing pressure sores

(Geeganage et al, 2012)
Interventions aimed at improving nutrition

• Early nasogastric feeding

Starting tube feeding early after stroke may reduce death although the information available remains inconclusive.

(Geeganage et al, 2012)
FOOD Trial 2 - Early tube vs Avoid

Within 1st week of admission

- 859 patients failed swallow screen
- 429 Early tube
- 430 Avoid tube for at least a week & hydrate using parenteral fluids
**FOOD Trial 2 - Outcome at 6 month follow up**

- Percentage of patients:
  - Avoid tube feeding:
    - 19.8% MRS 0 to 3
    - 31.9% MRS 4 to 5
    - 48.1% Dead
  - Early tube feeding:
    - 21.0%
    - 36.6%

**Reduction in death with early tube = 5.8%**
(95% CI -0.8 to 12.5) \( p = 0.086 \)

**Reduction in poor outcome with early tube = 1.2%**
(95% CI -4.2 to 6.6) \( p = 0.672 \)
Benefit of early tube over delayed tube

Feed 100 patients within first 3 days
Prevent about 6 deaths
Five of those saved will remain disabled
95% Confidence intervals of absolute benefit of early tube over delayed tube

1 extra death

13 fewer deaths
Food for thought – misplaced tubes
National Patient Safety Agency (2005)

• 11 deaths due to misplaced tubes in UK over 2 years
• 1 million NG tubes purchased by NHS per year in UK
• Advised only to use pH testing or X Ray
• Took no account of adverse effects of this advice
  – Delays in medication, intermittent fluids and feeding
Checking the position of NG tube

- Air insufflation — "whoosh test"
  - Need training in optimal method
  - Decent stethoscope
- pH of aspirate
- X Ray
- Aware of the strengths and weaknesses of each method
- Be able to apply a combination of methods
## Combining tests

<table>
<thead>
<tr>
<th>Whoosh 1st person</th>
<th>pH of aspirate</th>
<th>CXR</th>
<th>Whoosh 2nd person</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ve</td>
<td>pH&lt;5.5</td>
<td>Not required</td>
<td>Not required</td>
<td>Feed</td>
</tr>
<tr>
<td>+ve</td>
<td>No aspirate or pH &gt;5.5</td>
<td>+ve</td>
<td>Not required</td>
<td>Feed</td>
</tr>
<tr>
<td>+ve</td>
<td>No aspirate or pH &gt;5.5</td>
<td>impractical</td>
<td>+ve</td>
<td>Feed</td>
</tr>
<tr>
<td>-ve</td>
<td>pH&lt;5.5</td>
<td>+ve</td>
<td>Not required</td>
<td>Feed</td>
</tr>
<tr>
<td>-ve</td>
<td>No aspirate or pH&gt;5.5</td>
<td>Not required</td>
<td>Not required</td>
<td>Replace tube</td>
</tr>
</tbody>
</table>
Other technologies which need evaluation

Capnography – measuring CO2 in aspirated air

Electromagnetic guidance
Keeping NG tubes in place
Nasal bridles improve delivery of NG feed and fluids and reduces reinsertions (Beavan et al)
Interventions aimed at improving nutrition

• PEG tube feeding

If longer-term feeding is required PEG feeding provides better nutrition and is more secure than a NG tube.

(Geeganage et al, 2012)
High quality care?

• Determine the objectives of care

• To optimise survival and outcome
  – Routinely assess swallow, hydration & nutritional status
  – If able to swallow
    • implement simple interventions to maintain hydration and nutritional status
  – If dysphagic
    • parenteral fluids
    • then NG tube but ensure correct position and secured
    • PEG where prolonged feeding required
Delivering this consistently

Scottish National Standard

• 90% of patients should be screened by a standardised assessment method to identify any difficulty swallowing safely due to low conscious level and/or the presence of signs of dysphagia on the day of admission before the patient is given any food/drink or oral

• In 2005 it was recorded in 47% of stroke patients in Scottish hospitals
Early swallow screen
Implementing swallow screen and every other aspect of “high quality care”

- Define the process of care
- Determine who does what, when?
- Provide training, more training and still more training!
- Monitor the process
- Identify exceptions
- Feedback to the team
- ? Improve the process
- ? Improve the training
Reducing dehydration in stroke patients
Hart SR, Craig R, Berry E, Lane N, Gad A, Farrugia M, Burton L, Paquay A

- Urea/Creat ratio
- Day 0, 1, 2, 3, 4, 5, 6, 14
- Training Mittens & bridles
- Prescription of NG water
Summary

• Assessment of swallowing, hydration and nutrition is a vital process
• Sub-optimal care is widespread
• Optimising these will improve patients outcomes