Malnutrition and outcome after acute stroke: using the Malnutrition Universal Screening Tool

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Prevalence of malnutrition after acute stroke

- A significant number of stroke patients are already undernourished at the time of hospital admission
- Reported prevalence has varied from 8%\(^1\) to 62%\(^2\)
- Discrepancy due to patient selection, differences in definition of malnutrition and parameters used to assess

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Consequences of poor nutrition after acute stroke

• Good evidence that poor nutritional status at the time of hospital admission is associated with worse outcome\textsuperscript{1, 3-7}
  – Complications during hospital admission
  – Poor functional outcome
  – Increased length of stay
  – Mortality

• FOOD Trial 2003\textsuperscript{6}
  – Independent predictor of longterm outcome
Screening for malnutrition in stroke patients

  – All hospital patients should be screened on admission
  – Screening should be repeated on a weekly basis
  – Malnutrition Universal Screening Tool (MUST) suggested as an appropriate tool

• National Stroke Strategy 2007
  – All patients on an acute stroke unit should have access to a dietician service which should include nutritional screening
Malnutrition Universal Screening Tool (MUST)

**Step 1**
BMI score

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

**Step 2**
Unplanned weight loss score

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

**Step 3**
Acute disease effect score

- 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

**Step 5**
Management guidelines

0 Low Risk
Routine clinical care
- Repeated screening
  - Hospital: weekly
  - Care Homes: monthly
- For special groups e.g., those >75 yrs

1 Medium Risk
Observe
- Document dietary intake for ≥2 days if subject is hospitalised or care homes
- If improved or adequate intake: base clinical decisions on follow-up assessments
- Repeat screening
  - Hospital: weekly
  - Care Homes: at least monthly
  - Community: at least every 2-3 months

2 or more High Risk
Treat
- Nutritional support team
- Local authority
- Home style
- Social care
- Regular follow-up
- Unless deterioration or no benefit is reported from nutritional support e.g., improved weight.

All risk categories
- Tread under-filling conditions and provide help and advice on fluid balance, nutritional intake
- Record malnutrition risk category
- Record weight for special groups and for low-risk groups

Identifies patients identified at risk as they move through care settings
See the MUST Respiratory Module for further details and the MUST Report for supporting evidence.
Aims

• To survey the malnutrition risk of patients admitted with acute stroke using the MUST
• To determine the association between MUST category and outcome

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Method

• Prospective study of consecutively admitted acute stroke patients to St Helier Hospital (Nov 07-Mar 08)
• Acute stroke (cerebral infarction or primary intracerebral haemorrhage)
• Patients screened using the MUST within 72 hours of admission
• Followed up until 3 months after acute stroke
Outcome

• Primary outcome measures
  – Mortality
  – Barthel score
    • Non-disabled 15-20
    • Disabled <15

• Secondary outcome measures
  – Complications during inpatient stay
  – Length of stay
Statistical analysis

• Data from medium and high risk categories combined: Low vs Medium/High risk\textsuperscript{11,12}

• Fisher’s test
  – categorical primary/secondary outcomes

• Mann Whitney test
  – length of stay
Results

• 69 patients recruited into the study
• Age range 32-100
• Mean age 79.4 years
• 58% (n=40) were female
Malnutrition risk on admission

MUST category on admission

- Low: 62.3%
- Med: 5.8%
- High: 31.9%
Low risk vs Medium/High risk

• No significant difference between MUST category and…
  – Age (p=0.12)
  – Sex (p=0.45)
  – Co-morbidity
  – Pre stroke Barthel (p=0.72)

• However medium/high risk patients significantly more likely to have
  – Higher NIHSS (p<0.01)
  – Dysphagia (p<0.01)
Inpatient mortality

- Significantly higher inpatient mortality in medium/high risk patients 30.8% vs 4.7% in low risk patients
- $p<0.01$

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Mortality at 3 months

- Significantly higher mortality at 3 month follow up in medium/high risk patients
- p<0.05

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Functional outcome

• No significant difference between MUST category and disability on discharge or at 3 months

• In patients who were not disabled pre-stroke (Barthel>15), MUST category was significantly associated with disability on discharge (p<0.05) but not at 3 months (p=0.33)
Length of stay (LOS)

In those patients who survived to discharge

• Low risk: median LOS = 15 days
• Medium/high risk: median LOS = 41.5 days

• p<0.01

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Post stroke infections

• 57.7% of medium/high risk patients developed pneumonia compared to 25.6% of low risk patients (p<0.05)

• No difference between MUST category and UTIs (p=0.58)
Overall outcome at 3 months

Overall outcome at 3 months

Overall outcome at 3 months

Overall outcome at 3 months

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Summary of findings

• A high proportion (37.7%) of stroke patients were at risk of malnutrition
• Malnutrition risk significantly associated with
  – Increased length of stay
  – Pneumonia
  – Worse functional outcome at discharge
  – Higher mortality

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Limitations of the study

• Medium/high risk patients were significantly more likely to have
  – Longer length of stay
  – Dysphagia
  – More severe strokes (higher NIHSS)
• Dysphagia and stroke severity are predictors of poor outcome\textsuperscript{13-15}
• Due to small study size unable to control for these factors
Conclusions

• A high proportion of acute stroke patients are at risk of malnutrition on hospital admission
• Significant association between MUST category and poor outcome
• Study highlights the importance of malnutrition screening in all stroke patients
• Supports the recommendations made by NICE

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References


