

Nutritional Status of Pediatric Orthopedic Spine Surgical Patients: Pilot Study

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BACKGROUND

- » Malnutrition is a state of nutrition wherein deficiency or excess of nutrients causes adverse effects on clinical outcomes.¹
- » Malnutrition has been identified as a risk factor for adverse surgical outcomes including delayed recovery.
- » Anywhere from 6-40% of already hospitalized children suffer from malnutrition.^{2,3,4,5}
- » Prevalence of malnourished children may impact pediatric hospitals with prolongation of hospital stay and increased costs of care.
- » Little is known about the nutritional status of pediatric patients prior to surgery, which may affect their recovery post-operatively.

OBJECTIVE

- To review the nutritional status of patients who underwent orthopedic spine surgeries at BC Children's Hospital.
- To determine the focus of future nutritional studies in this population.

METHODOLOGY

Study Type: Retrospective Chart Review

Inclusion Criteria: Patients who have undergone elective posterior spine fusion surgery at BCCH from January 2012 to June 2013.

Exclusion Criteria: Emergency cases

Data Collection: Medical records were reviewed for the child's date of birth (age), gender, height and weight measurements, and the date of the surgical procedure (date measurements were taken).

Data Analysis:

- » Cases classified according to idiopathic or neuromuscular scoliosis.
- » Epi Anthroplus software to calculate weight-for-age and BMI-for-age Z-scores according to WHO growth standards.
- » Shapiro-Wilk Normality Test to determine if patient sample distribution is from a parent distribution that is normal.
- » Scatterplot Analysis to categorize growth in terms of Height-for-age and BMI (Fig. 1).

RESULTS

- » A total of 126 cases were classified as either Idiopathic or Neuromuscular.
 - Idiopathic: 97 charts (90 reviewed, 7 with missing height measurements)
 - Neuromuscular: 29 charts (9 reviewed, 20 with missing height measurements)
- » Neuromuscular cases were excluded due to low sample size.
- » The Idiopathic patient population follows standard normal distribution.
- » BMI was interpreted relative to height to project a more realistic nutritional status.
- » This resulted in four categories of patient nutritional status:

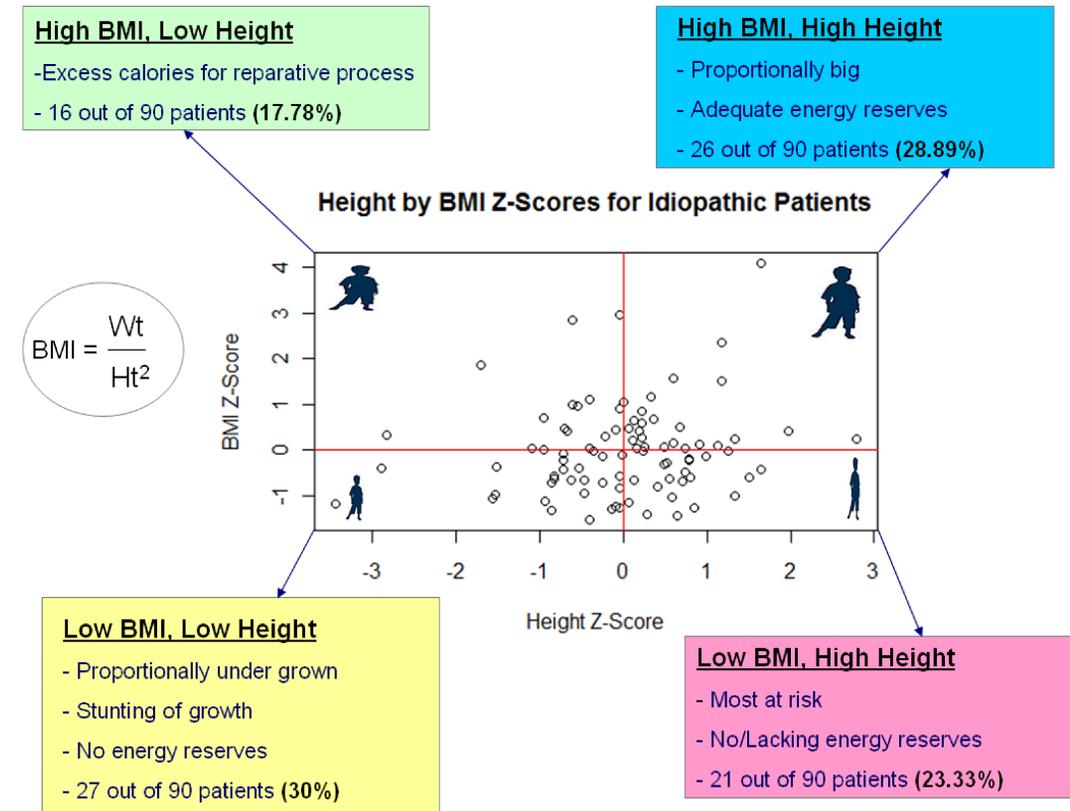


Fig. 1 BMI Z-scores against Height-for-age Z-scores Scatterplot for Idiopathic patients. Z-scores allow us to combine the height and weight of children in different ages for both boys and girls.

CONCLUSION

- » Malnutrition is a particular concern for patients undergoing surgery.
- » The rehabilitation process post surgery requires additional energy to expedite recovery.
- » Stress of surgery creates hypermetabolic state and may lead to an onset of protein calorie malnutrition within few days post operation.
- » Patients with poor energy reserves are at high risk for developing adverse surgical outcomes.

LIMITATIONS

- » Data only included pre-operative measurements.
- » Neuromuscular patients had to be excluded due to missing height measurements.

FUTURE DIRECTIONS

- » To conduct a prospective study on pediatric orthopedic hip and spine patients:
 - Validate a malnutrition screening tool.
 - Use non-invasive clinical indicators to identify nutrition status.
 - Compare Pre-operative nutritional status with surgical outcomes.
- » To investigate the prevalence of malnutrition in other pediatric surgical departments.

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