Cost effectiveness analysis of duration of nonoperative management for adhesive bowel obstruction in a developing country

Olatoke Samuel1, Agodirin Olayide2, Rahman Ganiyu3, Yusuf Funsho1, Adeyemi Olusola2

1. Division of General Surgery, Department of Surgery, University of Ilorin Teaching Hospital 2. Radiology Department, University of Ilorin Teaching Hospital

Abstract

Adhesive bowel obstruction (ABO) costs billions of dollars in developed countries. Cost is unknown in developing countries and duration of hospital stay. Nonoperative management (NOM) of uncomplicated obstruction is safe for up to 10 days. While it remains cost effective, the most efficient duration of nonoperative management must retain its advantages over operative management.

Aim

To describe cost effectiveness of various durations of nonoperative management of adhesive obstruction in a developing country.

Method

Over 2 year period, Patients who had uncomplicated adhesive obstruction were observed on trial of nonoperative management. Length of hospital stay and success rate were combined as surrogates for Cost effectiveness analysis of 2 to 5 days and ≥7 days nonoperative management.

Results

41 patients (24 (58.5%) females) were eligible. Mean age 38.4 ± 14.7 (range 18-80) years. 31 (75.6%) were first time admissions. Most of successful nonoperative management was within 5 days, 4 days nonoperative management had the highest cost utility.

Conclusion

From this study, without indications for immediate surgical intervention, 4 days nonoperative management is the most cost effective course, after which surgical intervention may be considered if there is no improvement.

Introduction

Adhesive bowel obstruction (ABO) is blockade of luminal flow of bowel content due to trapping or entanglement of bowel loops by fibrous or fibrinous bands between peritoneal surfaces. It is the leading cause of intestinal obstruction (IO) in developed countries and it is overtaking strangulated hernia as the most common cause of IO in developing countries. ABO is the most common general surgical complication of intra-abdominal adhesions necessitating re-admission and surgical intervention. Other complications of intra-abdominal adhesions are chronic pain and infertility. Unlike strangulated hernia, ABO is difficult to diagnose and decision making on whether to proceed to operative management (OM) or attempt non-operative management(NOM) is more challenging. The difficulties in decision making escalate the overall cost of management, contribute to poor outcome and increase the suffering felt by patients. The monetary implication of surgical intervention and hospitalization for ABO was estimated at $1.3 billion/year in the United States of America in 1994. A recent report estimates the cost at $2 billion/year. The monetary implication of management of ABO is unknown in developing centers. The escalating cost of ABO management is related to duration of admission and re-admission, and the morbidity of delayed OM or inappropriate OM. The aim of this study was to describe the cost of management decisions, specifically, the cost effectiveness of various duration of NOM among patients who presented with ABO in a poor resource center in order to facilitate management decision making.

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As expected, in the exploratory analysis, the cost of treatment for patients who had OM was significantly higher than those who were managed non-operatively by NOM. There was a direct relationship between cost of treatment and the duration of suck and drip irrespective of the outcome of NOM (figure 2). The cost of OM could have been escalated because all patients had initial trial of NOM. This implies that if we can select patients who are unlikely to succeed on NOM, then early OM should minimize their overall cost of treatment. So, research describing methods of accurately identifying patients unlikely to benefit from NOM are required. If there are no reasons for immediate surgical intervention, continuing NOM for 4 days, after which OM should be considered if there is no significant improvement, was found to be the most cost effective course of action. The cost utility analysis showed that for an additional day of dNOM beyond 3 days, the benefit score was higher and an additional 4 successes were recorded at about $62 extra cost per success. Compared to the status quo, the 5 dNOM also had higher benefit score and additional 10 successes for additional 2 days beyond 3 days of NOM. However, the 5dNOM compared unfavorably with the 4 dNOM.

It is important to discuss limitations of this study as will be expected for studies on economic analysis. To start with, we assumed homogeneity of illness progression and course of treatment. We also assumed that the length of hospital stay is directly related to the morbidity and cost of treatment. Hence, the cost of NOM was estimated by simple mathematical combination of endpoints, namely the LOS and the nTOM. These endpoints are intermediate endpoints limiting the overall outcome of the index admission in contrast to the commonly used measures such as quality adjusted life years (QALY) which considers the effect of the intervention beyond the current intervention and the duration of the controlled existent illness. Although we have found 4 dNOM to be most cost effective, interpretation of finding on economic analysis should not be in a vacuum. It should depend on the costing method, the context of analysis and the limits of willingness to spend.

Finally, the cost of managing ABO can be highly variable. The costing method in this study employed the less stringent and rather narrower macro-costing of the direct hospital charges, excluding the indirect hospital charges and the non-hospital and intangible charges.

Conclusion
With respect to the management of an index admission only, when there are no reasons for immediate surgical intervention, continuing NOM for 4 days, after which OM should be considered if there is no significant improvement, was found to be the most cost effective course of action in this study.

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