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The clinical effectiveness and economic analysis of bariatric surgery for severe obesity

Introduction

According to the Korean National Health and Nutrition Examination Surveys(KNHANES), the obesity of BMI 25kg/m^2 or more in adults is the tendency increasing from 26.0% in 1998 to 31.3% in 2009, and also the prevalence of severe obesity(BMI > 30kg/m^2) increased markedly from 2.4% to 4.7% during the same period. Severely obese patients suffer pain due to a variety of associated diseases, and their socioeconomic status is low. It has been reported that if the severely obese is treated, the complications are improved and the mortality rate will be reduced, and despite of that the need to pay for the obesity surgery is constantly being raised, the effort for the establishment of the obese therapy method and the social support for the treatment are insignificant in Korea.

Objective

The purpose of this study was to evaluate the cost-effectiveness as well as effectiveness and safety of bariatric surgery in severely obese people in Korea. In addition, we assessed the overall social difficulties on people living with obesity. This study would be helpful to understand the need of social support for people with severe obesity. The details are as follows:

- Effectiveness and safety of bariatric surgery in the severely obese patients
- Quality of life(QoL) investigation in the severely obese patients
- Economic analysis for bariatric surgery compared with conventional therapy
- Qualitative research and study of the knowledge, attitude, and practices in general practice

Methods

☐ Effectiveness and safety of bariatric surgery in the severely obese patients

In retrospective cohort study, we reviewed the medical charts of 261 consecutive subjects who underwent bariatric surgery such as laparoscopic adjustable gastric banding(LAGB), laparoscopic Roux-en-Y gastric bypass(L-RYGB), and laparoscopic sleeve gastrectomy(LSG) at the departments of surgery of seven Korean tertiary medical centers and 224 subjects who were treated with weight control medication and lifestyle modification therapy

at the departments of family medicine of two Korean tertiary medical centers between Jan 2008 and Feb 2011. Measures of clinical effectiveness, including change in weight(%) and comorbid diseases, and occurrence of complications, were investigated for 18 months after bariatric surgery.

□ Quality of life investigation in the severely obese patients

The QoL was investigated for the 78 patients(surgery group 53, non-surgery group 25) who re-visited the medical centers from Jul 2011 to Oct 2011 among patients who included in the retrospective cohort study. The instruments for QoL were EQ-5D, Impact of Weight on Quality of Life-Lite Questionnaire(IWQOL-Lite), Obesity-related Problem scale(OP-scale).

□ Economic analysis for bariatric surgery compared with conventional therapy

The economic analysis in the severely obese patients treated with bariatric surgery were performed by Korean healthcare system perspectives. The comparison alternative is the non-surgical group who were treated by conventional therapy such as pharmacotherapy and lifestyle modification therapy(exercise, diet).

The cost-effectiveness analysis for the patient with diabetes and severe obesity was performed. The time horizon was one year and the decision tree model was used. The transition probabilities and effectiveness were estimated through a medical chart review, and the costs were estimated by the expert survey of the nine hospitals.

The cost-utility analysis on the severely obese patients having a BMI of 30-40 kg/m^2 was performed by using markov model combined decision model. The time horizon is lifetime with starting age of 30 years and cycle length is one year. The health status was comprised of five states such as no comorbidity, mild/moderate comorbidity(diabetes, hypertension, dyslipidemia), severe comorbidity(myocardial infarction, ischemic heart disease, stroke), death due to coronary vascular disease, and death due to other cause. The probabilities of death were obtained from a medical chart review. The transition probability of comorbidities and the utility weight for each obese status was obtained gain using KNHANES IV. The cost data was collected from the physicians survey and the Korean National Health Insurance Statistics.

□ Qualitative research and study of the knowledge, attitude, and practices in general practice

The qualitative research was conducted in 10 people with severe obesity to assess the cause of obesity, the social difficulties on people living with obesity, and the risk factors exaggerating the obesity. For this qualitative research, focus group interview and face-to-face interview were used. In addition, the survey of 100 general practitioners was conducted to see the knowledge, attitude, and clinical practice for the obesity treatment.

Results

▣ Effectiveness and safety of bariatric surgery in the severely obese patients

The surgical therapy of severely obese patients was more effective for weight loss compared to conventional therapy. The change in weight(%) between baseline and 18 months post-treatment was significantly greater in

the surgery group(22.6%) than in the conventional therapy group(6.7%)(Figure 1).

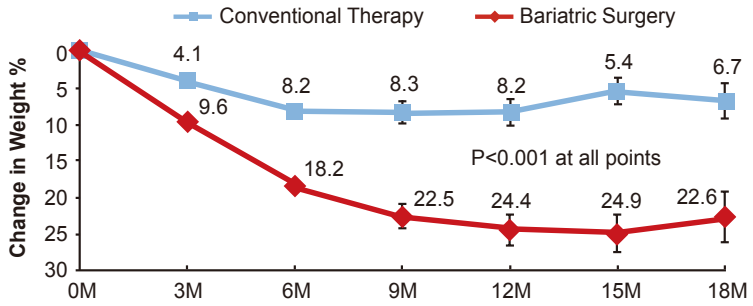

Figure 1. Comparison of Percentage of weight loss between the surgery and conventional therapy groups

The percentage of excess weight loss and excess BMI loss, and the absolute weight loss showed a similar tendency. The recovery from comorbidities such as diabetes, hypertension, and dyslipidemia, with a reasonable complication rate was more effective in the surgical group(Figure 2).

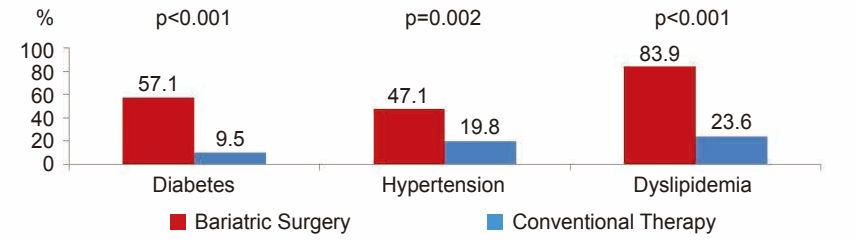

Figure 2. Comparison of recovery from comorbidities between the bariatric surgery and the conventional therapy in severely obese patients

☐ QoL investigation in the severely obese patients

The QoL improvement after treatment has the trend of positive relationship with % weight loss for all QoL questionnaires. That means the more weight loss, the greater QoL is improved irrespective of treatment method. The QoL was more improved in surgery group because surgical treatment achieved more weight loss than non surgical treatment(Figure 3).

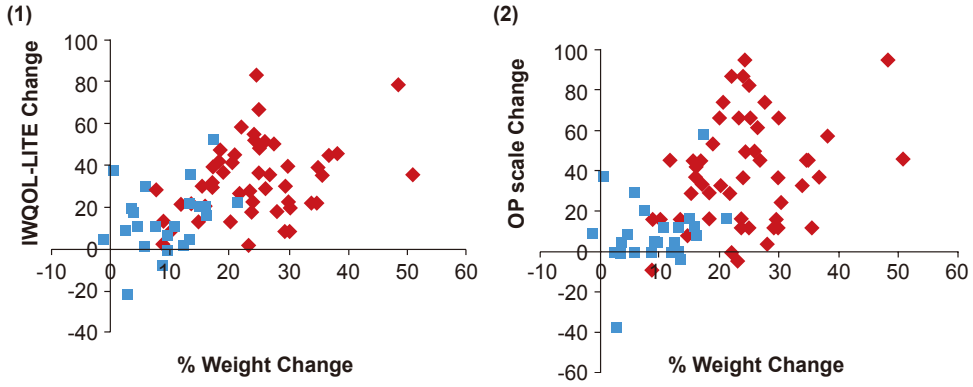

Figure 3. Relationship between % weight change and the score change of each QoL questionnaire

* Correlation P-value (1) 0.025 in surgery group, 0.102 in non-surgery group. (2) 0.090 in surgery group, 0.188 in non-surgery group

□ Economic analysis for bariatric surgery compared with conventional therapy

As the results of cost-effectiveness analysis, the bariatric surgery had higher cost(US$9,273) and better effectiveness(18.1% weight loss), the Incremental Cost-Effectiveness Ratio(ICER) was US$512 per one-percent weight loss. Through the subgroup and sensitivity analysis under various conditions, robustness of the study results was also demonstrated.

The cost-utility analysis study indicated that bariatric surgery had US$1,522 incremental costs and 0.86 incremental quality-adjusted life years(QALYs) as compared to non-surgical interventions. Through the base case analysis, ICER was US$1,771/QALY. The sensitivity analyses were performed using a variety of assumptions and the robustness of the study results was also demonstrated.

Limitations

It may be the limitation of this study that because only tertiary hospitals have been participated in the study due to the difficulty of obtaining data, the clinical conditions can not be reflected well. Also, as the demographic characteristics of the surgery and non surgical therapy are different by using the retrospective medical chart review, the subgroup analysis according to BMI, age and gender was performed. In addition, there is the limitation that the follow-up period was short as 18 months.

Conclusions

This study have significant meaning as the national clinical research comparing the obesity surgery and non-surgical therapy. Bariatric surgery had significant weight loss and improvement of QoL, when compared with conventional therapy in patients with severe obesity. The recovery from co-morbidity was better in surgery group. The economic analysis results that bariatric surgery was cost-effective alternative to conventional therapy. In addition, both severely obese people and health care professionals thought that social support for severe obesity was very limited. Considering gaps between obesity management guideline and knowledge levels among general practitioners, the appropriate training for the obesity management is needed for better practice among general practitioners.

Further information

1. Oh SH, Song HJ, Kwon JW, Park DJ, Lee YJ, Chun H, Kim S, Shim KW. The improvement of quality of life in patients treated with bariatric surgery in Korea, J Korean Surg Soc. 2013 Mar;84(3):131-139.
2. Heo YS, Park JM, Kim YJ, Kim SM, Park DJ, Lee SK, Han SM, Shim KW, Lee YJ, Lee JY, Kwon JW. Bariatric surgery versus conventional therapy in obese Korea patients: a multicenter retrospective cohort study, J Korean Surg Soc. 2012 Dec;83(6):335-342.
3. Kim GE, Jang SY, Choi YB, Hur YS, Oh SW, Kwon JW, Lee SH. Is Surgery Necessary for Morbid Obesity Patient? NECA Round-table Conference Consensus Statement, J Korean Obes. 2013 Mar;22(1):7-12.

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