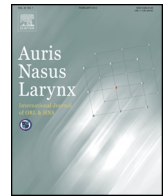




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## Impact of the Korean Diagnosis-Related Groups payment system on the outcomes of adenotonsillectomy: A single center experience

Sang Hyun Kwak, Ji Hoon Kim, Da Hee Kim, Jung Min Kim, Hyung Kwon Byeon, Won Shik Kim\*, Yoon Woo Koh, Se-Heon Kim, Eun Chang Choi

Department of Otorhinolaryngology, Yonsei University College of Medicine, Seoul, Republic of Korea

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### ABSTRACT

**Objectives:** To report outcomes with regard to clinical aspects and medical costs of adenotonsillectomy and tonsillectomy at a single institution before and after implementation of the Diagnosis-Related Groups (DRG) payment system in Korea.

**Methods:** We retrospectively reviewed the records of patients treated with adenotonsillectomy or tonsillectomy between July 2012 and June 2014. The Korean DRG payment system was applied to seven groups of specific diseases and surgeries including adenotonsillectomy and tonsillectomy from July 2013 at all hospitals in Korea. We divided patients into four groups according to whether the fee-for-service (FFS) or DRG payment system was implemented and operation type (FFS-adenotonsillectomy (AT), DRG-AT, FFS-tonsillectomy (T), and DRG-T).

**Results:** A total of 1402 patients were included (485 FFS-AT, 490 DRG-AT, 203 FFS-T, and 223 DRG-T). The total medical cost of the DRG-AT group was significantly lower than that of the FFS-AT group ( $1191 \pm 404$  vs.  $1110 \pm 279$  USD,  $P < 0.05$ ). There were no significant differences in length of hospital stay or postoperative complications among groups.

**Conclusion:** The Korean DRG system for adenotonsillectomy and tonsillectomy reduced medical costs and clinical outcomes were not significantly altered by the adoption of the DRG system.

**Level of evidence:** 4.

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## 1. Introduction

The Korean health payment system has been structured as a fee-for-service (FFS) system for many years; however, recently, the nation's medical costs have rapidly increased [1]. Therefore, the Korean Diagnosis-Related Groups (DRG) payment system was developed and implemented for seven groups of specific diseases and surgeries, including adenotonsillectomy and tonsillectomy, from July 2013 at all hospitals

in Korea. Adenotonsillectomy and tonsillectomy are among the most common operations performed in otorhinolaryngology departments according to the 2012 annual report of the Health Insurance Review & Assessment Service, Korea; over 35,000 underwent tonsillectomy or adenoidectomy [2].

The DRG system was first introduced as a payment system for Medicare in the United States in 1983, and has since been implemented worldwide, including in many European countries. Implementation of this system seeks to encourage appropriate care and discourage unnecessary care in individual hospitals by limiting payment amounts.

Within the Korean medical community, debate is ongoing regarding how best to reduce medical costs and maintain health-care system quality. Adenotonsillectomy and tonsillectomy are

\* Corresponding author at: Department of Otorhinolaryngology, Yonsei University College of Medicine, 50 Yonsei-ro, Seodaemun-gu, Seoul, 120-752, Republic of Korea. Fax: +82 2 393 0580.

E-mail address: [wskim78@yuhs.ac](mailto:wskim78@yuhs.ac) (W.S. Kim).

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relatively easy surgeries to perform; however, there are possible complications, such as postoperative bleeding, which can be fatal.

The aim of this study is to compare clinical outcomes and medical costs between the FFS and DRG payment systems with regard to adenotonsillectomy and tonsillectomy operations.

## 2. Material and methods

The DRG system has been applied since July 2013 at Severance hospital, Seoul, Korea. Our institution is a tertiary hospital and one of the largest hospital in Korea. We reviewed patients who underwent tonsillectomy or adenotonsillectomy performed by 19 surgeons in our department, between July 2012 and June 2014, retrospectively. Our indication for adenotonsillectomy and tonsillectomy is not different from other hospitals. The patients were included when there was airway disturbance or obstruction due to enlarged tonsillar tissues or when the patients complaints with frequent tonsillitis [3]. The patients routinely visit our department after 1 week of surgery and last follow up of patient was made routinely 2week after the surgery. The post operative care in outpatient clinic does not differ regardless of the DRG system implementation. We divided patients into two groups based on DRG system implementation.

Surgical procedures were not altered with the implementation of the Korean DRG system. Simple tonsillectomy was done with an electrical blade and adenoidectomy was performed with an adenoid curette under general anesthesia via a perioral approach. Bleeding control was via a bipolar coagulator.

We compared the total medical costs, length of hospital stay, emergency department (ED) visits for 4 weeks postoperative, and the causes of these ED visits.

Medical costs are presented in US dollars (USD) at an exchange rate of 1200 Korean Won to 1 USD.

Patients who were diagnosed with cancer, those who underwent combined surgeries like septoplasty, and those in

whom a ventilation tube was inserted were excluded from the study group.

Statistical analyses were performed using IBM SPSS statistics ver. 2.2. Continuous variables were compared using the student t-test and categorical variables were compared using the Pearson chi-square test. All P-values were two-sided and  $P < 0.05$  was considered statistically significant.

## 3. Results

### 3.1. Baseline characteristics

Table 1 summarizes the baseline characteristics of the two groups. Between the two groups, there were no significant differences in baseline characteristics such as mean age.

Between July 2012 and June 2013, 688 patients underwent adenotonsillectomy or tonsillectomy under the FFS system. Among them, 485 patients underwent adenotonsillectomy (FFS-AT), and 203 patients underwent tonsillectomy (FFS-T). Between July 2013 and June 2014, 714 patients underwent adenotonsillectomy or tonsillectomy under the DRG system. Among them, 490 patients underwent adenotonsillectomy (DRG-AT), whereas 224 patients underwent tonsillectomy (DRG-T).

### 3.2. Postoperative outcomes

The length of hospital stays for adenotonsillectomy and tonsillectomy did not vary significantly. Under the FFS system, the mean length of hospital stays of the FFS-AT group was 3.07 days, and that of the FFS-T group was 3.03 days. After DRG system implementation, the mean length of hospital stays of the DRG-AT group was 3.06 days and that of the DRG-T group was 3.02 days (Table 2).

The total medical costs of the DRG-AT group were significantly lower than those of the FFS-AT group

**Table 1**  
Baseline characteristics.

Characteristic	FFS-AT	DRG-AT	P-value	FFS-T	DRG-T	P-value
No. of patients	485	490		203	224	
Sex						
Male	313	298		90	108	
Female	173	192		113	116	
Age (years)	6.74 ± 4.13	6.61 ± 3.04	0.58	27.16 ± 11.16	24.87 ± 15.19	0.079

FFS-AT, fee for service—adenotonsillectomy; DRG-AT, Diagnosis-Related Groups—adenotonsillectomy; FFS-T, fee for service—tonsillectomy; DRG-T, Diagnosis-Related Groups—tonsillectomy.

**Table 2**  
Comparison of postoperative outcomes.

Variables	FFS-AT	DRG-AT	P-value	FFS-T	DRG-T	P-value
Length of hospital stay (days)	3.07 ± 0.47	3.03 ± 0.02	0.099	3.06 ± 0.47	3.02 ± 0.34	0.243
Total medical costs (USD)	1191 ± 404	1110 ± 279	<0.001	1049 ± 488	1003 ± 274	0.224
No. of ED visits after surgery	28	36	0.366	40	28	0.047

FFS-AT, fee for service—adenotonsillectomy; DRG-AT, Diagnosis-Related Group—adenotonsillectomy; FFS-T, fee for service—tonsillectomy; DRG-T, Diagnosis-Related Group—tonsillectomy; USD, US dollar; ED, emergency department.

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