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Economic Impact of Facial Plastic and Reconstructive Surgery: The Case Mix Index

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Abstract

Background: The case mix index (CMI) represents the average medicare severity-diagnosis related group relative weight over a period of time. The higher the CMI, the more the hospital gets reimbursed, on average. Little has been published in regards to CMI within Otolaryngology particularly in Facial Plastic and Reconstructive Surgery.

Aim: This study was performed to determine the economic impact of Facial Plastic and Reconstructive Surgery has on hospital medicare reimbursements.

Methods: In a retrospective review we analyzed the admissions of facial plastic and reconstructive surgeons as well as general otolaryngologists at a tertiary medical center from October 2015 through May 2018. General otolaryngology excluded pediatrics, otology, and admissions under fellows. The admissions analyzed were limited to patients that required observation or intervention from a plastics perspective. Of the FPRS admissions, there were no patients included that were admitted for oncologic resection or surgeries that would have fallen within other specialties of otolaryngology. The case mix index was then calculated for each admission.

Results: There were two facial plastic and reconstructive surgeons and thirteen general otolaryngology surgeons who admitted patients from October 2015 through May 2018. A total of 103 admissions were found to have plastics-only observation or intervention. The average CMI for these patients was 2.92. Of the 1,918 general otolaryngology admissions, the average CMI was 2.62. There were 14 FPRS admissions that had a CMI of less than 1.00, and five of those did not have a procedure completed during the admission.

Conclusion: At the studied tertiary care center, case mix index values greater than a value of 2.2 indicated that the average medicare reimbursements per admission surpassed the costs of the admission. The result is a profit for the hospital. As demonstrated in our study, FPRS admissions consistently produced a profit for this tertiary medical center. Furthermore, FPRS admissions resulted in a greater average CMI as compared to admissions under general otolaryngologists.

Conflicts of Interest: The Authors declare no conflicts of interest.
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Introduction

Medicare payments are made to hospitals based on a multiple of a predetermined, fixed dollar amount called a blended payment rate. The blended payment rate is based on the mean of 2 or more payment algorithms based on a blend of local and federal area wage

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indices. The multiple of the blended payment rate is a sum of another predetermined value called the medicare severity-diagnosis related group (DRG) weight. The DRGs are designated by the Inpatient Prospective Payment System (1, 2). As defined by Section 1886 (d) of the Social Security Act, each diagnosed medical condition of a patient has its own DRG weight (2). The value of each DRG weight is based on the average resources used to treat Medicare patients in that DRG (2). A sum of each DRG weight that a patient has during the admission is then multiplied by the blended payment rate. The product is the minimum monetary amount that the hospital is paid for that specific admission. This payment is further supplemented by add-on payments determined by the percentage of low-income patients the hospital treats as well as whether or not the hospital is a teaching hospital (2).

The case mix index (CMI) represents the average medicare severity-diagnosis related group relative weight over a period of time (3). CMI is calculated by summing the DRG weights for all Medicare discharges over a predetermined time frame, which is then divided by the number of discharges over that timeframe (3). This value is essentially the average DRG weight over a designated time period and can be determined for the whole hospital, a specific specialty or even a specific group of admissions. The higher the CMI, the more the hospital gets reimbursed, on average. The break-even CMI value for a hospital is different at each institution due to the blended rate that Medicare reimburses the hospital. Therefore, a CMI greater than the break-even value reflects a low average cost per patient, while a CMI less than the break-even value reflects a high average cost per patient. The CMI represents a malleable value that can be used to analyze the economic impact of a designated group of Medicare admissions over a specific time period in the form of monetary reimbursements.

Little has been published in regards to CMI within Otolaryngology. In 2013, Jalisi et al. evaluated the CMI of head and neck oncologic surgeons within their tertiary medical center. They found that head and neck oncologic surgeons have a 4.39 greater likelihood of a CMI>1 when compared to their otolaryngology colleagues (4). The goal of our study was to expand upon this knowledge and evaluate the economic impact of facial plastics and reconstructive surgery (FPRS) admissions within a tertiary medical center.

Methods

In a retrospective review we analyzed the admissions of facial plastics and reconstructive surgeons as well as general otolaryngologists at a tertiary medical center from October 2015 through May 2018. For the purposes of this study, “general otolaryngology” excluded pediatrics, otology, and admissions under clinical fellows.

The admissions analyzed were limited to patients that required observation or intervention from a plastics perspective. Of the FPRS admissions, there were no patients included that were admitted for oncologic resection or surgeries that would have fallen within other subspecialties of otolaryngology. The case mix index was then calculated for each admission. The average CMI of facial plastics and reconstructive surgery was compared to the average CMI of general otolaryngology admissions.

Results

There were two facial plastic and reconstructive surgeons and thirteen general otolaryngology surgeons who admitted patients from October 2015 through May 2018. A total of 103 admissions were found to have plastics-only observation or intervention. The average CMI for the FPRS patients was 2.92. Of the 1,918 general otolaryngology admissions, the average CMI was 2.62.

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Discussion

Hospitals use CMI to determine their allocation of resources to treat patients. When a CMI for a group of patients is greater than the break-even value, the cost-per-patient is lower than what the hospital receives in reimbursement from Medicare, which results in a profit for the hospital. If the CMI is less than the break-even value, the hospital loses money per patient within the group that the CMI is analyzing **(5)**. As such, hospitals strive to universally improve CMI throughout specialities.

At the studied tertiary medical center, case mix index values of surgical cases greater than 2.2 indicated that the average medicare reimbursements per admission surpassed the costs of the admission. From October 2015 through May 2018, the facial plastic and reconstructive surgeons at the studied tertiary medical center averaged a CMI of 2.92. This averaged CMI was 0.72 higher than the break-even CMI of the hospital, and 0.3 higher than the average CMI of general otolaryngologists within the hospital. Furthermore, this means that the FPRS team was profitable by a multiple of 0.72 of the hospital's blended payment rate, as well as more profitable than general otolaryngology by a multiple of 0.3 of the hospital's blended payment rate.

As CMI only measures the economic impact of medicare patients, our study does not assess the out-of-pocket profits of FPRS and general otolaryngology. However, due to the income generated from cosmetics within FPRS, we assume that the profitability of FPRS as compared to general otolaryngology may be even greater than what was found in this study. Our proof of concept study is the first of its kind to compare the CMI of FPRS to other aspects of otolaryngology. Further studies may assess CMI as compared between other otolaryngology subspecialties, other surgical specialities, or factor in profitability from non-medicare related reimbursements. Using the CMI to assess the profitability of a FPRS surgeon is impactful not only because hospital administration uses it as an economic measure, but because it can be leveraged by the FPRS surgeon when it comes to negotiating employment contracts. A surgeon's primary responsibility is to that of his or her patient, however we believe that it is important for surgeons to have the knowledge of their financial impact on the care center they are employed by in order to determine how that care center may value them.

Conclusion

As demonstrated in our study, FPRS admissions consistently produced a profit for this tertiary medical center. Furthermore, FPRS admissions resulted in a greater average CMI as compared to admissions under general otolaryngologists.

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Conflicts of Interest

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