ORIGINAL ARTICLE

Effect of Co-management With Internal Medicine on Hospital Stay of Patients Admitted to the Service of Otolaryngology

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Keywords
Referral and consultation; Co-management; Otolaryngology; Internal medicine

Abstract
Introduction and objectives: Patients admitted to the Department of Otolaryngology (ENT) are increasing in age, comorbidity and complexity, leading to increased consultations/referrals to Internal Medicine (IM). An alternative to consultations/referrals is co-management. We studied the effect of co-management on length of stay (LoS) in hospital for patients admitted to ENT. Methods: This was a retrospective observational study including patients ≥14 years old discharged from ENT between 1/1/2009 and 30/06/2013, with co-management from May/2011. We analysed age, sex, type of admission, whether the patient was operated, administrative weight associated with DRG, total number of discharge diagnoses, Charlson comorbidity index (CCI), deaths, readmissions and LoS. Results: There were statistically significant differences between both groups in age (4.5 years; 95% confidence interval [95% CI] 2.8–6.3), emergency admissions (odds ratio [OR] 1.4; 95% CI 1.1–1.8), administrative weight (0.3637; 95% CI 0.0710–0.6564), number of diagnoses (1.3; 95% CI 1–1.6), CCI (0.4; 95% CI 0.2–0.6) and deaths (OR 4.1; 95% CI 1.1–15.7). On adjustment, co-management reduced ENT LoS in hospital by 28.6%, 0.8 days (95% CI 0.1%–1.6%; P=.038). This reduction represents an ENT savings of at least €165,893. Conclusions: Co-management patients admitted to ENT are increasing in age, comorbidity and complexity. Co-management is associated with reduced LoS and costs in ENT, similar to those observed in other surgical services.

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Efecto de la asistencia compartida con medicina interna sobre la estancia hospitalaria de los pacientes ingresados en el Servicio de Otorrinolaringología

Resumen

Introducción y objetivos: Los pacientes ingresados en el Servicio de Otorrinolaringología (ORL) están aumentando en edad, comorbilidad y complejidad, induciendo un incremento de interconsultas a Medicina Interna (MI). Una alternativa a las interconsultas es la asistencia compartida (AC). Estudiamos el efecto de la AC con MI sobre la estancia hospitalaria de los enfermos ingresados en ORL.

Métodos: Estudio observacional retrospectivo de los pacientes ≥ 14 años ingresados desde el 1 de enero del 2009 hasta el 30 de junio del 2013 en ORL; desde mayo del 2011 con AC con MI. Analizamos edad, sexo, tipo de ingreso, si fue operado, peso administrativo asociado a GRD, número total de diagnósticos al alta, índice de comorbilidad de Charlson (ICh), defunción, reingresos y estancia hospitalaria.

Resultados: Los pacientes con AC fueron de mayor edad (4,5 años, intervalo de confianza del 95% [IC del 95%], 2,8 a 6,3), con más ingresos urgentes (odds ratio [OR] 1,4; IC del 95%, 1,1 a 1,8), mayor peso administrativo (0,3637; IC del 95%, 0,0710 a 0,6564), mayor número de diagnósticos (1,3; IC del 95%, 1 a 1,6), ICh (0,4; IC del 95%, 0,2 a 0,6) y también de defunción (OR 4,1; IC del 95%, 1,1 a 15,7). Al ajustar, observamos que la AC redujo el 28,6% la estancia en ORL, 0,8 días (IC del 95%, 0,1 a 1,6; P = 0,038). Este descenso supone un ahorro, al menos, de 165.893 €.

Conclusión: Los enfermos ingresados en ORL están aumentando su edad, comorbilidad y complejidad. La AC se asocia a una disminución de la estancia y los costes en ORL, similares a los observados en otros servicios quirúrgicos.

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Introduction

Improvements in anaesthesiological and surgical techniques and procedures are leading to an increased amount of surgical interventions being performed on patients of greater age and with comorbidities. Furthermore, the development of outpatient surgery and short hospital stays means that many patients are not admitted to hospital for operations or are only admitted for a short period. As a result, the patients who are being hospitalised in surgical departments are increasing in age, comorbidity and complexity making the surgeons' job more difficult, particularly on the ward, due to medical pathologies and polymedication, among other factors. This difficulty makes greater cooperation necessary between medical departments in the care of patients who have undergone surgery and this in turn leads to an increase in requests for medical consultations/referrals, in particular to Internal Medicine (IM); this is not an efficient way of functioning.

Although there is very little available information on these issues with regards to the Otorhinolaryngology Department (ENT), this department is also experiencing increasing difficulties in managing its patients and making more requests for IM consultations/referrals. Up to 17.4% of consultations/referrals received by IM are from the area of ENT surgery. According to the literature, alcohol y and tobacco are implicated in 75% of patients with head and neck cancer, with a high percentage of disease processes related to them. 60%–75% of these patients have concomitant diseases, 20% with serious comorbidity; these diseases increase with age and are most commonly cardio-respiratory and metabolic. Comorbidity is a clear prognostic factor of mortality in these patients; the number of complications also increases, as does their severity, and hospital stay. An alternative to consultations/referrals is co-management (CM). This is gradually expanding, particularly in large surgical departments and has proven to be highly effective in our environment. This health care model was recently proposed for patients with head and neck cancer. In May 2011 we started to collaborate in this way with ENT, which is very different to other surgical departments in terms of characteristics and patient type. We have not been able to find any type of collaboration between IM and ENT comparable with that described in this article.

Our aim is to study the effect of CM with IM on the hospital stay of patients admitted to ENT departments.

Methods

There are currently 452 beds available in our hospital and we treat an almost exclusively urban population of 250,000 inhabitants. We teach at pre and post graduate level and the hospital is authorised to train medical and surgical resident doctors. The observational retrospective study included all patients ≥ 14 years of age, whether they had been operated on or not, who were admitted from 1st
January 2009 until 30th June 2013 to the ENT ward, and these were divided into 2 groups for comparison: one without CM and the second with CM with IM. During this period, this department’s activity did not significantly vary in organisation, with the only exception of CM with IM initiated on 18th May 2011.

The ENT department has been increasing the number of surgical procedures performed using major outpatient surgery; to be specific, most otological, rhinological, pharyngeal procedures and oncolgical pharyngolaryngeal surgery using CO2 laser are carried out in this way. The result is that at present it is mainly patients with head and neck pathologies who are hospitalised, the majority of whom require oncolgical procedures with external approaches to remove tumours, with or without reconstructive surgery. Furthermore, in recent years protocols have been put in place for the preservation of organs in oncological processes with the result that at present only those patients requiring rescue surgery are operated on, or those for whom chemo or radiotherapy is contraindicated. Due to the above, the complexity of hospitalised patients in the ENT department has increased. Patients hospitalised in the ENT department during the period analysed between 2009 and 2013 met with all the above-mentioned characteristics.

To sum up, CM requires all patients’ to be cared for by internists for the entire period of hospitalisation in the ENT department, exactly as occurs in IM wards: taking the patient’s clinical history and physical examination, requesting complementary tests and prescribing treatment, which the internists can do freely but in coordination with ENT surgeons. Internists never participate in decisions on hospital admission decisions or indication for surgery; these are exclusively the domain of the ENT surgeons.

The variables analysed were: age, sex, emergency hospital admission, whether the patient had been operated on or not, the administrative weight associated with the DRG, total number of diagnoses, the Charlson comorbidity index (CCI), which is validated for use with administrative databases,7 adjusted by updated ages and weights,10 hospital stay, deaths and re-admissions in under 15 days for any reason and in any unit. The data were obtained from our hospital’s minimum basic data set, which accepts up to 13 diagnoses coded according to the ICD-9-CM code. In 2010 the total average cost per day of stay in our hospital was 1490€ for ENT and 323€ for IM.

Statistical Analysis

We describe the age, stay, administrative weight, number of diagnoses and CCI with the mean and confidence interval of 95% (CI of 95%). The other variables, which are all qualitative, are described using percentages and their 95% confidence interval. Control variables were all those gathered from the study, with the exception of stay (study variable). We considered a precision of ±5 hundredths as sufficient for the type of work and the clinical nature of the findings, which we rounded down to a decimal, with the exception of the administrative weight which we kept at 4 decimals. The mean deviation between both groups was studied with the Student’s “t” Test. The other variables were analysed using the odds ratio (OR). We adjusted stay with a multiple linear regression model. The variables were included in the model using the step-wise regression method. The inclusion and exclusion criteria of the variables in the model were fixed at P<.05 for inclusion and P>.10 for exclusion. The final model was selected using the criterion of the square of the multiple adjusted correlation coefficient. The value of statistical significance was established at P<.05. Statistical analysis was performed using the SPSS 15.0 (SPSS Inc. Chicago, U.S.A.) statistical package.

Results

During the study period, the ENT unit admitted a total of 1629 patients ≥14 years of age. In the group with CM we observed an increase of 9.9% in age, 14.7% in emergency hospital admission, 27.9% in administrative weight, 48.1% in number of diagnoses and 33.3% in CCI (Table 1). Mortality increased in this group, although hospital stay did not decrease, as this was 15.6 days for the patients who died. When statistical adjustment was made with the significant variables in the univariate analysis, the mean stay, which in the data without adjustment was 0.7 days higher in the group with CM, reduced to 0.8 days (CI of 95%, 0.1 to 1.6; P=.038), a reduction of 28.6%.

Using the cost of a stay in IM, which is the most economical, as the benchmark, the reduction in mean stay achieved with CM relates to a reduction in costs: 642 patients × 0.8 stays avoided × 323€ = 165,893€, during the study period with CM, a little more than 25 months.

Discussion

Our results show that patients admitted into ENT are increasing in age, comorbidity and complexity, and that CM with IM relates to a reduction in hospital stay, which leads to a major drop in costs. The hospital stay study is of interest since, among other things, it is a good indicator of adverse events11 and health care costs.12

There are several reasons to explain these findings. CM with IM reduces stay, mortality and readmission, among other health care parameters, in surgical patients,13 probably because their clinical history is one of the most likely factors to lead to complications in surgical patients.14 Moreover, failure to rescue (delay in diagnosis and/or treatment of postoperative complication once it has occurred) is fundamental to results15 and mortality.16 In this regard, the daily work of internists may be of vital importance. At least 88% of patients admitted to surgical wards could benefit from CM with IM.17

Mortality and readmission, partly conditioned by premature discharge, may have an impact on hospital stay. Although there is an increase in mortality in the group with CM, it did not affect hospital stay, since these were patients whose stay was longer than the mean. By contrast, readmissions did not increase. Internist intervention helps the patient to leave hospital in a better condition and with fewer probabilities of being readmitted. We must bear in mind that 72.6% of surgical patients were readmitted for medical reasons.18

This study has its limitations. The type of design using historic controls implies a risk of bias due to the extensive
Effect of Comanagement With Internal Medicine on Hospital Stay of Patients

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td>No.</td>
<td>1629</td>
</tr>
<tr>
<td>Age (years; 95% CI)</td>
<td>47.1 (46.3-48.4)</td>
</tr>
<tr>
<td>Woman (%; 95% CI)</td>
<td>41.4 (39.4-44.4)</td>
</tr>
<tr>
<td>Emergency hospital admission (%; 95% CI)</td>
<td>15.5 (13.7-17.2)</td>
</tr>
<tr>
<td>Operated (%; 95% CI)</td>
<td>86.1 (83.4-87.7)</td>
</tr>
<tr>
<td>No. diagnosed (%; 95% CI)</td>
<td>1.4470 (1.3037-1.5902)</td>
</tr>
<tr>
<td>Charlson comorbidity index; n.s.</td>
<td>3.2 (3.1-3.3)</td>
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<tr>
<td>DIT/95% CI</td>
<td>6.42</td>
</tr>
<tr>
<td>With CM</td>
<td>49.9 (48.5-51.3)</td>
</tr>
<tr>
<td>Without CM</td>
<td>42.4 (38.5-46.2)</td>
</tr>
<tr>
<td>Age (years; 95% CI)</td>
<td>47.1 (46.3-48.4)</td>
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period of study (period effect), amongst others. In our case, it meant that the patients with CM without IM were more complex and had greater comorbidity. Another limitation is that the study refers to a single hospital; therefore our results must be confirmed in other hospitals and under other conditions. An additional disadvantage is that we have not found any documented references with which to compare our results.

Conclusions

CM with IM is associated with reduced mean stay and costs in relation to ENT, in line with what has already been observed in other surgical departments. CM with IM is a health care organisation model with good results in ENT.

Conflict of Interest

The authors have no conflict of interests to declare.

References