Omalizumab in Severe Asthma in the Province of Alberta – A Quality Assurance

Hailey Hitchings1,2, Justin Lem1, Cheryl Sadowski3, Scott Klarenbach1, Ian Robertson4, Chad Mitchell4, Carina Majaeisi4, Dilini Vethanayagam1

1Department of Medicine, Faculty of Medicine and Dentistry, University of Alberta, 2Department of Biomedical Sciences, University of Guelph, 3Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, 4Alberta Health Pharmaceutical Division

Introduction

- Severe asthma (SA) occurs in 5-10% of patients with asthma, half of which have immunoglobulin E (IgE)-mediated disease.
- Immunologic Treatment: Omalizumab (OM), trade name Xolair®, was the first biologic introduced into Canada for IgE-mediated SA in 2005. OM is an IgE neutralizing antibody biologic for treatment of moderate to severe asthma and Chronic Idiopathic Urticaria.
- OM treatment for SA has led to: decreased frequency of asthma exacerbations, hospitalization rates due to asthma, and inhaled corticosteroids use. Increase in all aspects of asthma-related quality of life.
- Biologic therapies such as OM are recommended as the last step in the treatment of asthma due in part to the high cost of treatment, adverse effects, and the need for careful patient selection.

Economic Impact:
- In 2016 CADTH calculated the annual cost of OM treatment varies between $7,956 and $47,736 CAD annually based on the Health Canada approved treatment regimen.4
- In the 5-year period prior to our study, the Government of Alberta (GOA) spent over $12 million on funding for OM treatment alone. The GOA has three programs that provide funding for OM: Alberta Health (AH) and Alberta Health Services (AHS) since 2012, and the Short-Term Exceptional Drug and Therapies (STEDT) 2013.
- For the treatment and maintenance of chronic diseases like SA, it is important to determine that treatment shows improvements in disease-specific parameters and sustainable by not causing a increased burden do the health care system.

Methods

- A retrospective review of publicly funded OM use from 2012-2017 was performed using data obtained from the Government of Alberta (GOA).
- Patient inclusion: Patients approved for funding of OM for the treatment of severe persistent asthma through different AH programs (AH, AHS, and STEDT) between 2012-2017.
- Demographics were examined, and physician reported pulmonary function, Asthma Control Questionnaire-5 (ACQ-5), Asthma Quality of Life Questionnaire (AQLQ); and health care utilization (hospitalization and physician visits) were compared in the 12-months prior to OM treatment and the subsequent 12-months on OM treatment.
- Data was retrieved from AH records and from Alberta Blue Cross Special Authorization Request Forms for OM use for asthma.

Results

Table 1. Mean changes in asthma symptom and physiologic related measures, captured by Alberta Blue Cross special authorization forms. Blue indicates an improvement of asthma outcomes, and red indicates a worsening of asthma outcomes.

Table 2. Mean changes in health care utilization, acquired from the AH pharmaceutical division. Blue indicates a decrease in utilization, and red indicates an increase in utilization.

Discussion

- The observed decrease in mean days spent in hospital and visits to the ED due to asthma after a 12-month OM treatment period is similar to other published studies on OM use.1,3
- Our study observed an increase in the means of all the asthma symptom related measures, which is corresponds to other published studies. However the observed increases may not be all representative of a clinically relevant change.
- Post-OM mean AQLQ score is considered moderate to excellent quality of life (cut-off of ≥4) whereas the pre-OM mean was considered moderate-to-poor.
- Post-OM mean ACQ-5 score is still indicative of “uncontrolled asthma” (cut-off of ≥1.5).
- Increase in the mean of the FEVI % predicted values by 6.7%, however the improvement was not sufficient to move the mean from moderate obstruction to mild obstruction.
- The slight increase in the mean number of concurrent asthma medications post-OM treatment is contrary to multiple published studies.1
- After the 12-month OM treatment the mean number of physician and specialist visits increased.
- This may demonstrate that OM is a treatment that requires a higher degree of maintenance than alternative asthma treatments, although more research is required in this area.
- This and the increase in concurrent asthma medications increases health care utilization and may increase the overall health systems cost of treatment.

Conclusion

- OM use was associated with improved asthma measures and lower ED and hospital use compared with the year prior to use. While causality cannot be established, this study demonstrates how routinely captured data could be used to assess effectiveness of treatments in severe asthma.
- There was an observed improvement in disease control and quality of life with biologic use in severe asthma, but also an observed increase in certain facets of healthcare utilization. When regarding the use of biologics, especially for a chronic condition such as asthma, a balance must be found between improved disease control and QOL, and the increase in healthcare utilization and cost.
- Increasing use of biological agents for many diseases warrant careful stewardship, rigorous criteria for use, and monitoring to ensure these products are effectively used for the public good.

References


Figure 1. Participant inclusion in the study.

- Mean age: 56 y/o
- Mean age at OM funding approval: 52
- All non-smokers
- 62 female, 44 male

Table 1. Mean changes in asthma symptom and physiologic related measures, captured by Alberta Blue Cross special authorization forms. Blue indicates an improvement of asthma outcomes, and red indicates a worsening of asthma outcomes.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre-OM treatment Mean (SD)</th>
<th>Post-12 month OM treatment Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACQ-5 score</td>
<td>3.14 (1.15)</td>
<td>1.73 (1.14)</td>
</tr>
<tr>
<td>AQLQ score</td>
<td>3.48 (1.44)</td>
<td>4.87 (3.15)</td>
</tr>
<tr>
<td>Ige level</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>FEVI % predicted</td>
<td>66.5 (19.2)</td>
<td>73.2 (19.4)</td>
</tr>
<tr>
<td>FEVI absolute value</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Table 2. Mean changes in health care utilization, acquired from the AH pharmaceutical division. Blue indicates a decrease in utilization, and red indicates an increase in utilization.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre-OM treatment Mean (SD)</th>
<th>Post-12 month OM treatment Mean (SD)</th>
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<tbody>
<tr>
<td>Days in hospital</td>
<td>0.65 (3.04)</td>
<td>0.54 (4.86)</td>
</tr>
<tr>
<td>ED admissions</td>
<td>0.33 (0.84)</td>
<td>0.31 (1.32)</td>
</tr>
<tr>
<td>Physician visits</td>
<td>2.68 (4.14)</td>
<td>3.19 (5.92)</td>
</tr>
<tr>
<td>Specialist visits</td>
<td>4.34 (4.81)</td>
<td>5.64 (7.09)</td>
</tr>
<tr>
<td>Concurrent asthma medications</td>
<td>2.55 (1.88)</td>
<td>2.85 (1.60)</td>
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