

Systematic Review of Clinical and Economic Evidence for Primary Open-Angle Glaucoma Therapy with Tafluprost vs Travoprost

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Abstract

According to WHO, the number of patients with glaucoma in the world ranges from 60.5 to 105 million people, and the number of such patients is also predicted to increase to 80 million. Out of 28 million blind people in the world almost one in five lost their sight due to glaucoma. The aim of this research is to conduct a systematic review of the clinical and economic evidence for the treatment of primary open-angle glaucoma with Tafluprost vs Travoprost. Methods: PubMed interface, MEDLINE, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, NICE databases were used as main searching sources of this study.

Index terms— primary open-angle glaucoma, systematic review, clinical efficacy, economic efficiency, PubMed.

1 Introduction

Glaucoma is one of the leading causes of blindness, it is a chronic disease that visual area is reduced permanently because of optic nerve damage.

According to the World Health Organization, total number of patients with glaucoma in the world ranges from 60.5 to 105 million people, and increasing this number is predicted to 80 million. There is significant an increase the role of glaucoma among primary disability causes, the nosological structure increased up to 20% in the last decade. According to the statistics of WHO, more than 28 million people in the world faced to the blindness, it means almost one in five has lost sight cause of glaucoma.

In majority of patients (about 86%) suffer from glaucoma for a long time, the disease passes into a more severe stage. In this regard, this disease is not only purely medical issue, but also it is social problems.

The research questions were asked in discussions with healthcare providers, clinical professionals, and other healthcare stakeholders.

The aim of the study was to conduct a systematic review of the clinical and economic evidence for the therapy of primary open-angle glaucoma (POAG) with Tafluprost vs Travoprost.

2 II.

3 Materials and Methods

A literature search was performed on PubMed interface and used for the MEDLINE database, in addition, the Cochrane Central Register of Controlled Trials, the Cochrane Database of Systematic Reviews, and NICE were used to search for relevant literature. As an input of medical librarians, search strategy was developed by using appropriate keywords and control variables. In order to obtain relevant information on the prevalence of glaucoma and other important evidence, we searched the gray literature on various health websites. The formulation of the PICO concept is very critical because it facilitates the therapeutic question and directly addresses the relevant issues, defining the key concepts that should be the focus of our economic analysis of health care.

42 The acronym PICO is presented in the following In order to evaluate clinical outcomes feedback was requested
43 from several associations involved in glaucoma therapy in Tashkent city. We turned to an ophthalmologist, nurses
44 who regularly diagnose glaucoma in patients. The role of the clinical expert was to critique our requests, provide
45 information regarding the patient management algorithm, review the clinical review plan and medical technology
46 assessment.

47 Economic literature search was conducted to cover studies conducted from inception to the date of the search.
48 PubMed interface was used for the Medline database, and the Cochrane Central Register of Controlled Trials,
49 Cochrane Database of Systematic Reviews, and NICE were used to search relevant literature. By input from
50 medical librarians, a search strategy was developed with relevant keywords and control variables, with an economic
51 filter set. In order to obtain relevant information on the current prevalence of glaucoma and other important
52 evidence, we conducted a gray literature search on various health websites.

53 Titles and abstracts of the papers were carefully reviewed, for those studies that should meet the eligibility
54 criteria, we purchased articles with full content and completed further evaluation for eligibility.

55 4 III.

56 5 Results and Discussions

57 A clinical efficacy literature search identified 434 studies, including those obtained from database searches and
58 additional sources. After removing duplicates and irrelevant studies assessed by title selection, 285 citations
59 remained. Finally, only 2 articles meet the inclusion criteria. To report the studies, we found in systematic
60 reviews, we developed the PRISMA Chart (Preferred Reporting Items for systematic reviews and meta-analyses)
61 (Figure ??). Two single arm cohort studies were selected because they met the inclusion criteria. The first
62 study examined IOP adjustment and visual area imperfection movement over a 3-year period while adjusting
63 Travoprost eye drops monotherapy in patients with POAG [2]. A second cohort study examined the effects of
64 Tafluprost eye drops on IOP changes, visual area progression, safety, and side effects in patients with POAG [3].

65 We were unable to find studies examining mortality due to glaucoma. In addition, there is no any research
66 conducted to investigate patients with advanced and end-stage glaucoma treated with our interventions. Overall,
67 both Travoprost and Tafluprost were found to be effective interventions for lowering intraocular pressure
68 in patients with POAG. Innoueeetal. (2012) in their randomized control trial showed the effectiveness of
69 Travoprosteye drops in reducing IOP, which in the long term was 16.1-36.6%, while the reduction in IOP by
70 $21.9 \pm 14.0\%$ with the introduction of Tafluprost in patients with POAG. There have been no reports of visual
71 area impairment due to long-term use of Tafluprost and Travoprost eye drops. Significant differences in average
72 and standard deviation of the model were not observed before and after treatment with follow-up 3 years in both
73 analyzed studies. It can be seen that when comparing the efficacy of the two interventions, Travoprost had a
74 slightly higher efficacy in lowering IOP than Tafluprost among patients with POAG [2,3].

75 A systematic review identified one study evaluating the economic effectiveness of Travoprost and Tafluprost
76 in the treatment of pre-intervention openangle glaucoma in previously untreated 65-year-old patients.

77 Intraocular pressure, visual area characteristics, and patient value of drugs are derived from published
78 retrospective clinical reviews and randomized control trials with a follow-up period of 20 years. Average wholesale
79 prices were taken to calculate drug price data for both social and direct eye care costs. As recommended by
80 the Health and Medicine Cost Efficiency Panel, all costs and benefits assessed by the patient were discounted
81 annually at a rate of 3%. The results showed that each anti-intervention drug has demonstrated clinical and
82 economic effectiveness. Travoprost scored 1.92 QALYs (15% improvement in quality of life) over a 20-year period,
and Tafluprost scored a slightly higher score of 1.99 QALYs ??14.2%^{1 2}

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below:

[Note: FShoyusuf F.]

Figure 1: table 1

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<p>Acronym</p> <p>P Population (patients)</p> <p>I Intervention (Intervention -an alternative method of treatment (relatively new))</p> <p>C Comparator (Comparator - traditional treatment)</p> <p>O Outcome efficiency (The result is profitability) of economic</p>	<p>General definition</p> <p>Intervention -an alternative method of treatment (relatively new)</p> <p>Comparator - traditional treatment)</p> <p>(The result is profitability) of economic</p>	<p>Acceptance of the model</p> <p>Patients over 40 with open-angle glaucoma</p> <p>Tafluprost is a prostaglandin analogue eye used to prevent the progression of open-angle glaucoma by lowering intraocular pressure(IOP)</p> <p>Travoprost is a prostaglandin analogue eye used to prevent the progression of open-angle glaucoma by lowering IOP.</p> <p>Lowering IOP and delaying the progression of glaucoma</p>
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Figure 2: Table 1 :

2

<p>Identification</p> <p>Screening</p> <p>Included</p> <p>Authors, Country, year</p>	<p>Records identified through database searching (n=45)</p> <p>Records screened (n = 50)</p> <p>Full-text articles assessed for eligibility (n = 10)</p> <p>Studies included in reviews (n = 1)</p> <p>Purpose of the study</p>	<p>Additional records identified through other sources (n = 20)</p> <p>(n =50)</p> <p>Full-text articles excluded(n=9):</p> <ul style="list-style-type: none"> ? Pre-clinical ? Laser therapy ? Abstracts ? Article is not related to economic efficiency <p>Randomized groups</p> <p>Basic mean deviation(MD)</p> <p>Patients (n)</p> <p>Average (SD)</p>
<p>Inoue, Iwasa, Wakakura and Tomita, 2012</p>	<p>Japan</p> <p>To study the area efficiency. efficiency of long-term Travoprost monotherapy without (BAC) on IOP and visual</p>	<p>Mean IOP at switch on 16.8±2.6 mmHg.</p> <p>-5.4±4.7dB</p> <p>33/43</p> <p>4.8±13.9</p>

Figure 3: Table 2 :

3

Author s, year	Level of IOP reduction	Progression field of view
Inoue, Wakakura and Tomita (2012)	When treated with Travoprost 14.1±2.4 mmHg (Before treatment: 16.8±2.6 mmHg)	2.8%-13.9%
Innoue, Tanaka and Tomita (2013)	When treated with Tafluprost 12.8±2.8 mmHg Art. (before therapy: 15.7±2.2 mmHg)	10.3%-13.8%

Figure 4: Table 3 :

4

Figure 5: Table 4 :

Author year	Study type	Population	Intervention	Health outcomes	Results	Research
Brown et al. (2019)	Cost-utility analysis	Patients 40 years of age	Tafluprost vs Travoprost	sensitivity analyzes were also performed with upper and lower IOP limits at 95% confidence intervals. Tafluprost remained with the best QALY scores among other interventions.	1.99 QALY (17.9%) \$1,	Ex- Ef- pe- pensis riod ciency

lower IOP limits at 95% confidence intervals. Tafluprost remained with the best QALY scores among other interventions. A study by Brown et al. (2019) showed that even though Travoprost is cheaper than Tafluprost,

Figure 6:

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