Quality of Evidence in Ophthalmology: An Overview of Cochrane Reviews

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Abbreviations and Acronyms:

AMD: age-related macular degeneration

CSR: Cochrane systematic review

GRADE: grading of recommendations assessments, development and evaluation

IQR: inter-quartile range

RCT: randomized controlled trial

SOF: summary of findings

Introduction

Evidence based medicine (EBM) strives to base clinical decisions as much as possible on the most current and highest level of evidence.[1] Systematic reviews can be helpful in summarizing the current best evidence for a particular clinical question to support both individual decision-making and development of clinical practice guidelines.[2]

Since its inception in 1993, Cochrane has become established as a comprehensive resource for appraised and synthesized evidence. Since 2008,[3] Cochrane recommends that review authors use a specific approach to summarizing the overall quality, also termed the certainty, of the body of the evidence for key outcome measures: the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.[4,5]

To date, no study has considered the overall certainty of evidence for different outcome measures in Cochrane systematic reviews in the ophthalmology field.

The aims of our study were to provide an overview of Cochrane systematic reviews (CSRs) in ophthalmology, and to summarize the quality of evidence by subspecialty.

Methods

Study design

We performed a cross-sectional study of the quality of evidence in ophthalmology as reported in CSRs.

Data sources

We searched the Cochrane Database of Systematic Reviews (https://www.cochranelibrary.com/) to identify systematic reviews conducted by the Cochrane Eyes and Vision Group between October 2005 and July 2019. When there were several versions of the same review, we included only the most updated version.

Data extraction

Data were collected by a single reviewer (F.S.) using a dedicated data extraction form. To ensure consistency, a random sample of 15% of included CSRs was extracted independently by another reviewer (M.G.). Discrepancies were resolved by discussion and data checking.

Evaluation of quality of evidence

GRADE is used to assess and compare the quality of evidence. GRADE is summarized in the "summary of findings" (SOF) table.[6] We evaluated whether a SOF table was provided and if yes, we collected the quality of evidence of each outcome using GRADE based on the CSRs authors assessment. The evidence was classified as high quality if the authors were "very confident that the true effect lied close of the estimate of the effect"; moderate quality if they were "moderately confident in the effect estimate : the true effect is likely to be close to the

estimate of the effect, but there is a possibility that it was substantially different"; low quality if their confidence in the effect was limited: "the true effect may be substantially different from the estimate of the effect"; and very low quality if they had "very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect".[5] The GRADE depends in particular on risk of bias, heterogeneity, risk of indirectness of evidence, imprecision and publication bias.[5]

Data synthesis and statistical analysis

Qualitative data were described with frequencies and percentages, and quantitative data with median and interquartile ranges (IQRs).

Results

Selection of CSRs

Between October 2005 and July 2019, 217 CSRs were published by the Cochrane Eyes and Vision Group.

Ophthalmic subspecialties

The distribution of all CSRs in various ophthalmic subspecialties is depicted in Supplementary Table 1 (available at www.aaojournal.org). Overall, the three most frequent subspecialties were retina (n=59, 27%), glaucoma (n=34, 16%), and cornea & external diseases (n=34, 16%). The most frequent topics related to retina were age-related macular degeneration (AMD) (n=20, 34%), macular edema (n=11, 19%), and diabetic retinopathy (n=9, 15%).

General characteristics

General characteristics of all CSRs included are detailed in Supplementary Table 2 (available at www.aaojournal.org). The median year of publication was 2015 and the median number of participants 361. More than half of interventions were non-pharmacological therapies (n=116, 54%), including surgery and medical devices. The most common type of comparator treatment was active (n=91, 42%). Among the primary outcomes reported, the most common were functional outcomes (including visual acuity and visual field) (n=90, 41%), clinical examination (n=81, 37%) and symptoms (n=19, 9%). The median number of studies included in the CSRs was 3 (IQR 1 to 9). More than two-thirds of CSRs only included RCTs (n=157, 72%).

Quality of evidence for ophthalmology presented in CSRs

A total of 106 CSRs (49%) reported a SOF table with evaluation of the quality of evidence. The quality of evidence for at least one outcome was high in 19 CSRs (18%). Details for these 19 reviews are provided in Supplementary Table 3 (available at www.aaojournal.org).

Quality of evidence for all outcomes in the SOF

The median number of outcomes assessed per CSR was 5 (IQR 3 to 6).

A summary of the quality of evidence ratings for all outcomes (n=852) is provided by subspecialties in the Figure 1. Overall, only 6% (n=54) had a high-quality evidence. This rate was 15% for retina (n=40), 6% for cataract & refractive surgery (n=6), 3% for glaucoma (n=5), 2% for pediatrics (n=2) and 1% for cornea (n=1). For the subspecialty retina, the quality of evidence was high for some outcomes in the care of AMD (n=25, 62.5%), macular edema (n=9, 22.5%), macular hole (n=4, 10%), and diabetic retinopathy (n=2, 5%).

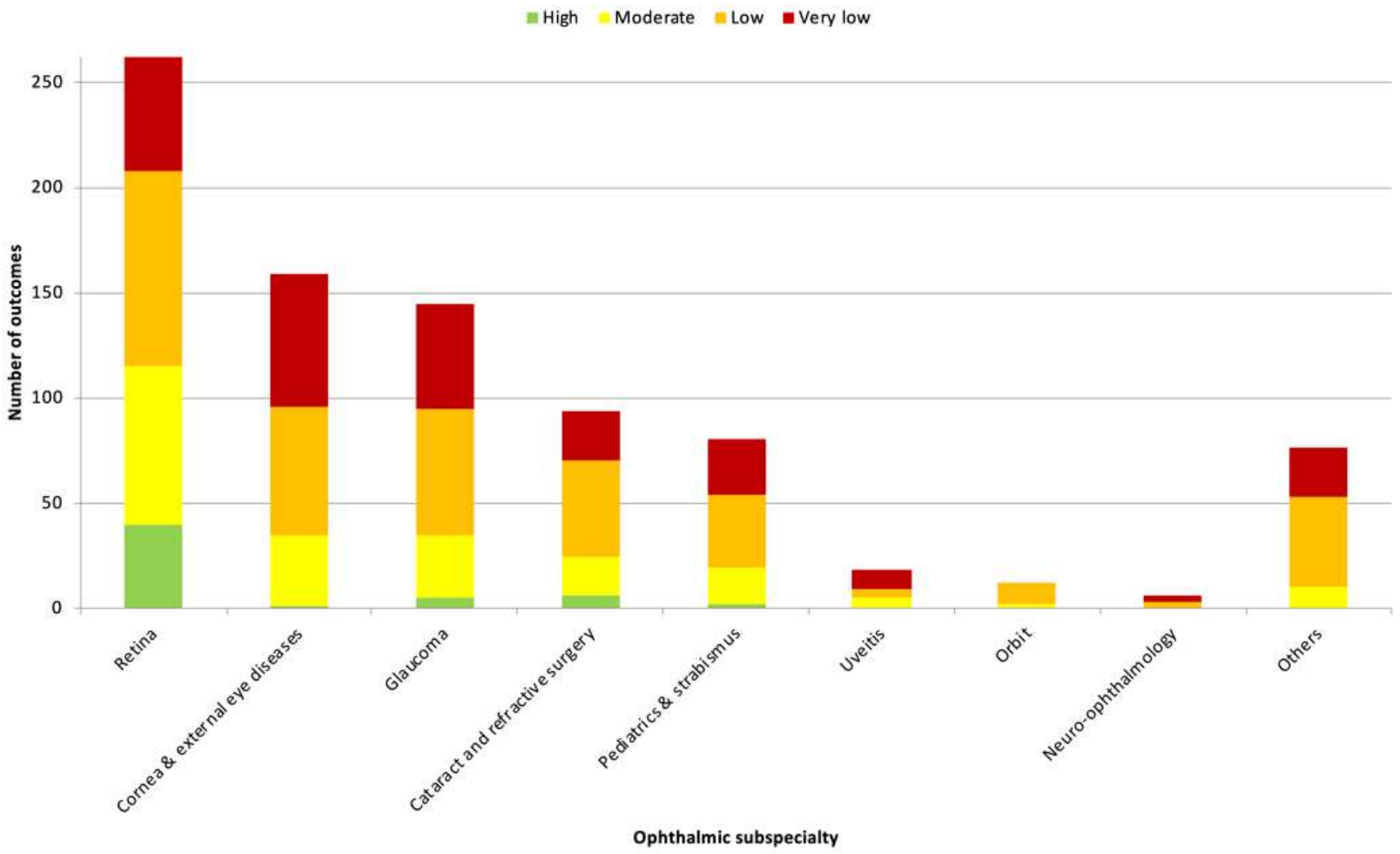
Discussion

In this overview of CSRs in ophthalmology, we found that the quality of evidence of at least one outcome was high in only 19 CSRs (18%) among 106 reporting GRADE. One of the reasons for the low quality of evidence in ophthalmology may be related to the frequency of non-pharmacological interventions including surgical procedures or medical devices. The regulatory requirements to demonstrate drug efficacy for marketing authorization are stricter than those required for surgery and devices. It may also be related to risk of bias inherent in studies of non-pharmacological treatments. Indeed, in many surgical trials for example, the interventions cannot be masked.

Conclusion

High quality of evidence, according to the GRADE approach, was often lacking in CSRs in ophthalmology. Only one in five CSRs in ophthalmology had outcome measures that were judged to have high quality of evidence. To provide clinicians with high certainty evidence on the efficacy and safety of many interventions, the level of evidence should be improved. Our study has identified gaps which can inform future research.

Figure 1 Distribution of quality of evidence of all outcomes (n=852) listed in 106 published Cochrane systematic reviews in ophthalmology from October 2005 to July 2019



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