Cataract surgery in patients with age-related macular degeneration

Review information

Authors

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Contact person

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What's new

Date / Event	Description

History

Date / Event	Description

Abstract

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Results

Authors' conclusions

Plain language summary

[Plain language title]

[Summary text]

Background

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Description of the intervention

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Why it is important to do this review

Objectives

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Acknowledgements

Contributions of authors

Declarations of interest

Differences between protocol and review

Published notes

Country:

Participants: patients with age-related macular degeneration (AMD)

Baseline demographics of study group:

Patient allocation procedure:

Follow-up period:

No of patients excluded after allocation:

No of patients lost to follow-up:

Blinding of patients:

Blinding of outcome assessment:

Characteristics of studies

Characteristics of included studies

Armbrecht 2003

Methods	Prospective, non-randomized, interventional study Country: The Royal Infirmary of Edinburgh, Scotland, UK Follow-up period: 4 + 12 months
Participants	Participants: patients with age-related macular degeneration (AMD) Baseline demographics of Group 1: patients with AMD and cataract (,n=40 (M=13, F=27)), mean age 80 yrs. 22/40 mild AMD, 2/40 wet AMD Baseline demographics of Group 2: patients with AMD and a clear view of the fundus (n=43 (M=17, F=26)), mean age 75 yrs. 14/43 mild AMD, 11/43 wet AMD
Interventions	Group 1: cataract surgery Group 2: no surgery
Outcomes	Progression of dry AMD to wet AMD was 0/36 in Group 1 and 2/42 in Group 2 BCDVA (logMAR, mean (SD)) in Group 1: baseline: 0.69 (0.39), 4 months 0.39 (0.46), 12 months (0.41 (0.49)) BCDVA (logMAR, mean (SD)) in Group 2: baseline: 0.44 (0.37), 4 months 0.41 (0.36), 12 months (0.50 (0.43))
Notes	Funding: grant from Gift of Thomas Pocklington and the University of Antioquia

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	"Two groups of patients were studied prospectively". Non-randomized study
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Patients could not be blinded as to whether they had cataract surgery or not. Not specified if personnel including the patients were blinded or not
Blinding of outcome assessment (detection bias)	Low risk	"The maculopathy grading at the 2 visits was masked so that the second assessments were made without knowledge of the first assessment"

Incomplete outcome data (attrition bias)	Unclear risk	"Of the 103 patients recruited... 83 patients were available for data analysis. Of these 83 patients, 5 failed to attend visit 2 and 5 failed to attent visit 3". No comparison between drop-outs and the analysed population provided
Selective reporting (reporting bias)	Low risk	Important outcomes reported
Other bias	Unclear risk	Distribution of the grading of AMD was different in study group (5% with wet AMD) and control group (25.6% with wet AMD) and 5% of fellow eyes in study group had wet AMD versus 58.2% in the control group. Mean patient age was 80 in the study group and 75 in the control group

Brunner 2013

Methods	RCT Country and clinic: Rudolfsstiftung Hospital, Vienna, Austria Follow-up: 12 months
Participants	Participants: patients cataract and non-exudative age-related macular degeneration (AMD) Baseline demographics of Group 1: age (mean (SD)) 80.3 (6.7), distance visual acuity 0.59 (0.27) Baseline demographics of Group 2: age (mean (SD)) 80.9 (5.8), distance visual acuity 0.47 (0.21)
Interventions	Group 1: Early (immediate) surgery group Group 2: Surgery was delayed by 6 months
Outcomes	Visual acuity (mean (SD)) at 12 months (i.e. 12 months after surgery in Group 1 and 6 months after surgery in Group 2) was 0.70 (0.35) in Group 1 and 0.64 (0.35) in Group 2 Total pixels (ROI) at 12 months was 202.7 (13.3) in Group 1 and 194.6 (12..4) in Group 2
Notes	Funding: grant from the Scientific Fund of the Major of Vienna, Austria

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Randomization was performed after baseline characteristics following fixed factors: sex, age, cataract grade and AMD staging". Not reported if the randomization was performed automatically or manually
Allocation concealment (selection bias)	Low risk	"Randomization was performed after baseline characteristics following fixed factors: sex, age, cataract grade and AMD staging"
Blinding of participants and personnel (performance bias)	Unclear risk	Not possible to blind patients. Not reported if personnel was blinded

Blinding of outcome assessment (detection bias)	Low risk	"Consecutively, the slides were sent to an outside grading center, blinded for all other patient data"
Incomplete outcome data (attrition bias)	Unclear risk	"of the 54 included patients, 49 finally finished all visits". No comparison between drop-outs and remaining study population
Selective reporting (reporting bias)	Low risk	Important outcomes were reported
Other bias	Low risk	Not likely to occur in this study

Hooper 2009

Methods	RCT Same study population as Lamoureux 2007 Country: Australia Follow-up period: 6 months
Participants	Participants: patients with cataract and age-related macular degeneration (AMD) Baseline demographics of Group 1: age (mean (SD)) 79.1 (6.2), duration of AMD 1.79 yrs (2.76) Baseline demographics of Group 2: age (mean (SD)) 78.7 (5.3), duration of AMD 5.52 yrs (14.99)
Interventions	Group 1: Patients with AMD randomized to immediate cataract surgery Group 2: Patients with AMD randomized to deferral of cataract surgery by 6 months
Outcomes	Progression of dry to wet AMD: 0/29 in Group 1 and 1/27 in Group 2 BCDVA (logMAR (mean (SD)): Group 1: 0.41 (0.26) at baseline and 0.13 (0.27) at follow-up BCDVA (logMAR (mean (SD)): Group 2: 0.37 (0.23) at baseline and 0.28 (0.23) at follow-up
Notes	Funding: private and public research grants

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"All study participants had a baseline assesment... and were then randomized to either a "treatment" or a "control" group". Method of randomization not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not possible to blind patients. Not reported if personnel was blinded
Blinding of outcome assessment (detection bias)	Unclear risk	Not reported
Incomplete outcome data (attrition bias)	Low risk	Of the 60 eyes recruited... four were lost to follow-up. One died, two emigrated and one refused continued participation"

Selective reporting (reporting bias)	Low risk	Not likely in this study
Other bias	Low risk	Not likely in this study

Footnotes

Characteristics of excluded studies

AREDS report 25

Reason for exclusion	Prospective, observational study. Reports risk of advanced AMD in patients undergoing/not undergoing cataract surgery

AREDS report 27

Reason for exclusion	Prospective observational study. Reports visual outcome in patients with AMD undergoing cataract surgery but does not compare to AMD patients not undergoing surgery

Armbrecht 2000

Reason for exclusion	Prospective, observational study. The same study population (except for a group of patients examined at Oxford and who had AMD assessed by funduscopy and not from photographs) is reported with a longer follow-up time in Armbrecht 2003

Baatz 2008

Reason for exclusion	Retrospective, case-control study. Compares progression of AMD in patients undergoing/not undergoing cataract surgery

Blair 1979

Reason for exclusion	Case series describing progrssion of AMD after cataract surgery

Cugati 2006

Reason for exclusion	Prospective, non-interventional study describing the association between cataract surgery and AMD

Cugati 2007

Reason for exclusion	Description of study design. Does not report results

Dong 2009

Reason for exclusion	Prospective observational study. Only reports AMD progression in patients undergoing cataract surgery without comparing to AMD patients not undergoing surgery

Fong 2011

Reason for exclusion	Prospective observational study. Only reports AMD progression in patients undergoing cataract surgery without comparing to AMD patients not undergoing surgery

Freeman 2003

Reason for exclusion	Metaanalysis. Reports OR after cataract surgery in patients with AMD undergoing surgery/no surgery but does not report the numbers of patients

Furino 2009

Reason for exclusion	Interventional study but does not have a control group. Does not compare outcome in patients with AMD undergoing cataract surgery to patients with AMD not undergoing surgery

Ho 2008

Reason for exclusion	Prospective observational study. Compares the risk of incident AMD in phakic and pseudophakic eyes but does not report the progression of AMD after cataract surgery or the visual outcome in patients with AMD undergoing/not undergoing cataract surgery

Iwami 2011

Reason for exclusion	Prospective observational study. Reports the progression of cataract after treatment for AMD, not the progression of AMD after surgery for cataract

Kaiserman 2007

Reason for exclusion	Retrospective case-control study. Compares the rate of PDT in patients undergoing cataract surgery versus patients not undergoing cataract surgery based on a medical billing database. The status of the patients macula prior to cataract surgery or in the controls is not described. Thus the number of patients with dry AMD in the case and control series is unknown

Klaver 1998

Reason for exclusion	Population-based study (The Rotterdam Study). Describes prevalence and causes of blindness and visual impairment

Klein 1994

Reason for exclusion	Population-based prevalence study (Beaver Dam). Describing the risk of AMD in eyes with cataract or prior cataract surgery

Klein 1998

Reason for exclusion	Prospective, cross-sectional, non-interventional study (Beaver Dam). Describes risk factors for progression of AMD

Klein 2002

Reason for exclusion	Population-based cohort study (Beaver Dam). Describes the risk ratios of 10 year incidence of AMD in persons with cataract or cataract surgery

Klein 2012

Reason for exclusion	Longitudinal, non-interventional study (Beaver Dam). Describing the relationship between cataract and cataract extration to AMD

Kovacevic 2008

Reason for exclusion	Retrospective study. Reports patients with AMD undergoing cataract surgery but does not compare to patients with AMD not undergoing cataract surgery

Kovacevic 2010

Reason for exclusion	Retrospective study. Compares progression of AMD in patients undergoing cataract surgery or no surgery. Not clear how patients or controls were selected, not clear how "late" or "aggressive" AMD was defined. Risk of bias deemed too high for the study to be included

Lamoureux 2007

Reason for exclusion	The same study population and results as published by Hooper 2009

Lundström 2002

Reason for exclusion	Prospective, observational study. Compares visual outcome after cataract surgery in patients with/without AMD but does not compare outcome in patients with AMD receiving/not receiving cataract surgery.

Mitchell 2002

Reason for exclusion	Population-based cohort study (Blue Mountains Eye Study). Describes 5 year incidence and progression of late AMD

Mönestam 2012

Reason for exclusion	Longitudinal cohort study. Compares visual outcome in patients undergoing cataract with/without AMD but does not compare the visual outcome in patients with AMD receiving/not receiving cataract surgery

Nolan 2009

Reason for exclusion	Compares macular pigment optical density in AMD patients undergoing cataract surgery with implantation of an Acrysof or Acrysof Natural (yellow) IOL. Does not compare to a group of AMD patients not undergoing cataract surgery

Pham 2005

Reason for exclusion	Retrospective review of hospital records. Does not compare the outcome in patients with AMD undergoing/not undergoing cataract surgery

Pham 2007

Reason for exclusion	Retrospective review of hospital records. Does not compare the outcome in patients with AMD undergoing/not undergoing cataract surgery

Pollack 1996

Reason for exclusion	Prospective, interventional study comparing risk of wet AMD in eyes undergoing cataract surgery versus fellow non-operated eyes. All patients had ECCE and not phacoemulsification

Pollack 1997

Reason for exclusion	Case series describing patients with AMD who developed exudative AMD after cataract surgery. Does not compare to a control group not undergoing surgery

Pollack 1998

Reason for exclusion	Prospective, observational study describing the incidence of wet AMD in eyes whose fellow eyes had had cataract surgery (ECCE) without progression. None of the patients were operated by phacoemulsification

Rohart 2008

Reason for exclusion	Prospective, interventional study comparing the outcome of cataract surgery in patients with early or late AMD. Does not compare to a group not having cataract surgery. Study published in French

Ruiz-Moreno 2010

Reason for exclusion	Interventional study but does not have a control group. Does not compare outcome in patients with AMD undergoing cataract surgery to patients with AMD not undergoing surgery

Shuttleworth 1998

Reason for exclusion	Retrospective study where cases (patients with AMD) were identified from a list of patients undergoing cataract surgery. The study reports the outcome of cataract surgery in patients with AMD but does not compare the progression of AMD in patients undergoing/not undergoing cataract surgery

Stolba 1989

Reason for exclusion	Prospective, interventional study. Compares outcome of cataract surgery in patients with/without wet AMD. Does not compare to a group not undergoing cataract surgery. Study published in French

Sutter 2007

Reason for exclusion	Cohort study. Does not compare the risk of neovascular AMD in patients undergoing cataract surgery. Compares risk of pseudophakia in eyes with neovascular AMD and fellow eyes

Tabandeh 2012

Reason for exclusion	Case reports. Evaluates the visual outcome after cataract surgery in patients with neovascular AMD but does compare to a control group not undergoing cataract surgery

van der Schaft 1994

Reason for exclusion	Histologic study of post-mortem eyes of patients with AMD and pseudophakia comparing AMD histological signs to the fellow phakic eyes

Wang 1999

Reason for exclusion	Population-based, non-interventional. Describes the prevalence of early and late AMD in eyes with cataract or cataract surgery

Wang 2003

Reason for exclusion	Combined analysis of two cohort studies (Beaver Dam and Blue Mountains Eye Study), both studies are cohort, non-interventional studies

Wang 2012

Reason for exclusion	Prospective interventional study comparing progression of AMD in eyes having cataract surgery >36 months ago and in fellow-eyes that were not operated or were operated withing 12 months. Thus the control group may included operated eyes. The prevalence of operated eyes in the control group was not reported

Xu 2011

Reason for exclusion	Cross-sectional study. Does not compare the progression of AMD in eyes undergoing/not undergoing cataract surgery

Footnotes

Characteristics of studies awaiting classification

Footnotes

Characteristics of ongoing studies

Footnotes

Summary of findings tables

Additional tables

References to studies

Included studies

Armbrecht 2003

[Published in: J Cataract Refract Surg; 29: 689-693]

[Empty]

Brunner 2013

[Other: Ophthalmologica; 229: 86-93]

[Empty]

Hooper 2009

[Published in: Clin Exp Ophthalmol; 37: 570-576]

[Empty]

Excluded studies

AREDS report 25

[Published in: Ophthalmology; 116: 297-303]

[Empty]

AREDS report 27

[Published in: Ophthalmology; 116: 2093-2100]

[Empty]

Armbrecht 2000

[Published in: Br J Ophthalmol; 84: 1343-1348]

[Empty]

Baatz 2008

[Other: Invest Ophthalmol Vis Sci; 49: 1079-1083]

[Empty]

Blair 1979

[Published in: AJO; 87: 77-83]

[Empty]

Cugati 2006

[Published in: Ophthalmology; 113: 2020-2025]

[Empty]

Cugati 2007

[Published in: Ophthalmic Epidemiol; 14: 408-414]

[Empty]

Dong 2009

[Published in: Arch Ophthalmol; 127 (11): 1412-1419]

[Empty]

Fong 2011

[Published in: Br J Ophthalmol; 95: 1652-1655]

[Empty]

Freeman 2003

[Published in: Am J Ophthalmol; 135: 849-856]

[Empty]

Furino 2009

[Published in: J Cataract Refract Surg; 35: 1518-1522]

[Empty]

Ho 2008

[Other: Invest Ophthalmol Vis Sci; 49: 4795-4800]

[Empty]

Iwami 2011

[Published in: Osaka City Med J; 57: 49-57]

[Empty]

Kaiserman 2007

[Published in: Ophthalmology; 114: 278-282]

[Empty]

Klaver 1998

[Other: Arch Ophthalmol; 116: 653-658]

[Empty]

Klein 1994

[Published in: Arch Ophthalmol; 112: 191-196]

[Empty]

Klein 1998

[Published in: Arch Ophthalmol; 116: 506-513]

[Empty]

Klein 2002

[Published in: Arch Ophthalmol; 120: 1551-1558]

[Empty]

Klein 2012

[Other: Ophthalmology; 119: 1628-1633]

[Empty]

Kovacevic 2008

[Published in: Coll Antropol; 32 (suppl): 9-10]

[Empty]

Kovacevic 2010

[Published in: Coll Antropol; 34 (suppl 2): 21-23]

[Empty]

Lamoureux 2007

[Published in: Optom Vis Sci; 84: 683-688]

[Empty]

Lundström 2002

[Published in: Br J Ophthalmol; 86: 1330-1335]

[Empty]

Mitchell 2002

[Other: Ophthalmology, 109: 1092-1097]

[Empty]

Mönestam 2012

[Published in: J Cataract Refract Surg; 38: 409-412]

[Empty]

Nolan 2009

[Published in: Invest Ophthalmol Vis Sci; 50: 4777-4785]

[Empty]

Pham 2005

[Published in: Clin Exp Ophthalmol; 33: 360-363]

[Empty]

Pham 2007

[Published in: Eye; 21: 324-330]

[Empty]

Pollack 1996

[Published in: Ophthalmology; 103 (10): 1546-1554]

[Empty]

Pollack 1997

[Published in: Eye; 11: 523-530]

[Empty]

Pollack 1998

[Published in: Ophthalmic Surg Lasers; 29 (4): 286-294]

[Empty]

Rohart 2008

[Published in: J Francis d´Opthalmol; 31 (6 Pt 1): 571-577]

[Empty]

Ruiz-Moreno 2010

[Published in: Int J Ophthalmol; 10 (7): 1245-1247]

[Empty]

Shuttleworth 1998

[Published in: Br J Ophthalmol 82: 611-616]

[Empty]

Stolba 1989

[Published in: J Fr Ophthalmol; 12: 897-901]

[Empty]

Sutter 2007

[Other: Invest Ophthalmol Vis Sci; 48: 1472-1475]

[Empty]

Tabandeh 2012

[Published in: J Cataract Refract Surg; 38: 677-682]

[Empty]

van der Schaft 1994

[Published in: Br J Ophthalmol; 78: 441-445]

[Empty]

Wang 1999

[Published in: Ophthalmic Epidemiol; 6: 317-326]

[Empty]

Wang 2003

[Published in: Ophthalmology; 110: 1960-1967]

[Empty]

Wang 2012

[Published in: Ophthalmology; 119: 2298-2303]

[Empty]

Xu 2011

[Published in: Graefe´s Arch Clin Exp Ophthalmol; 249: 981-985]

[Empty]

Studies awaiting classification

Ongoing studies

Other references

Additional references

Other published versions of this review

Data and analyses

1 Visual acuity

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
1.1 visual acuity, RCT	1	56	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.28, -0.02]
1.2 visual acuity, observational	1	78	Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.30, 0.12]

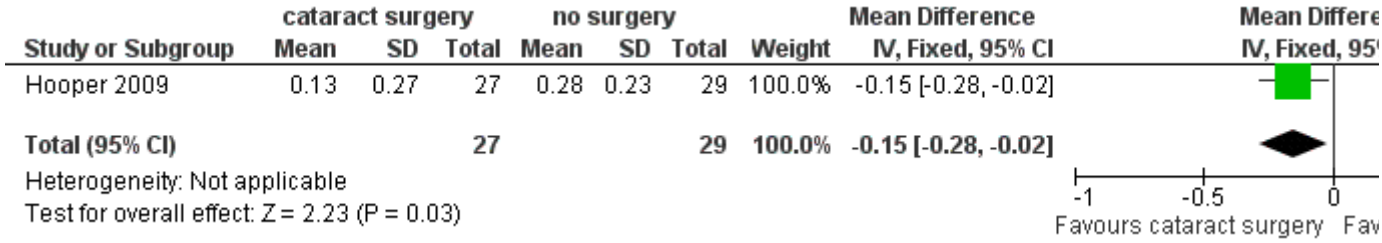
2 Progression to wet AMD, RCT

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
2.1 Progression to wet AMD, RCT	2	105	Risk Ratio (M-H, Fixed, 95% CI)	3.21 [0.14, 75.68]

2.2 Progression to wet AMD, observational	1	78	Risk Ratio (M-H, Fixed, 95% CI)	0.58 [0.06, 6.17]

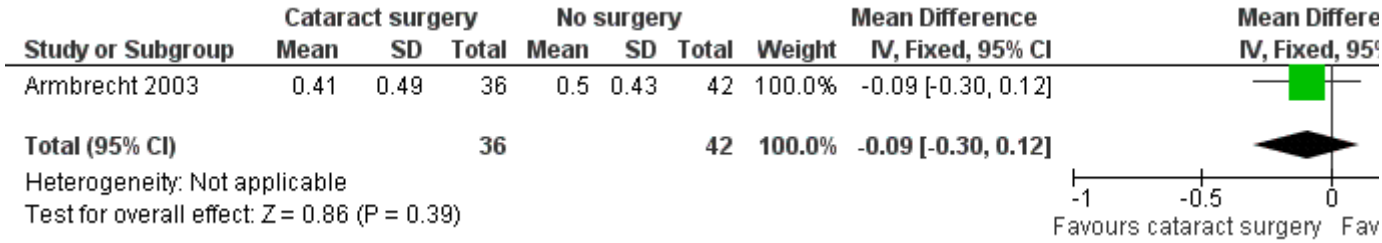
Figures

Figure 1 (Analysis 1.1)



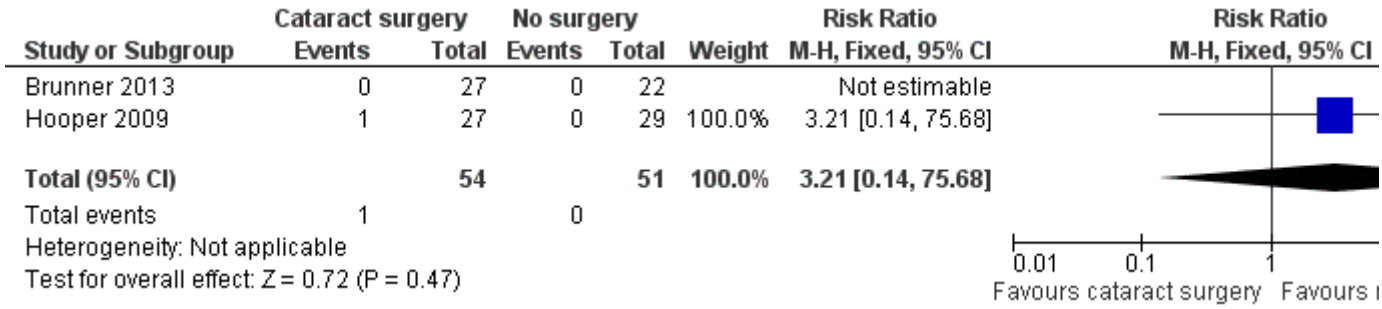
Forest plot of comparison: 1 Visual acuity, outcome: 1.1 visual acuity, RCT.

Figure 2 (Analysis 1.2)



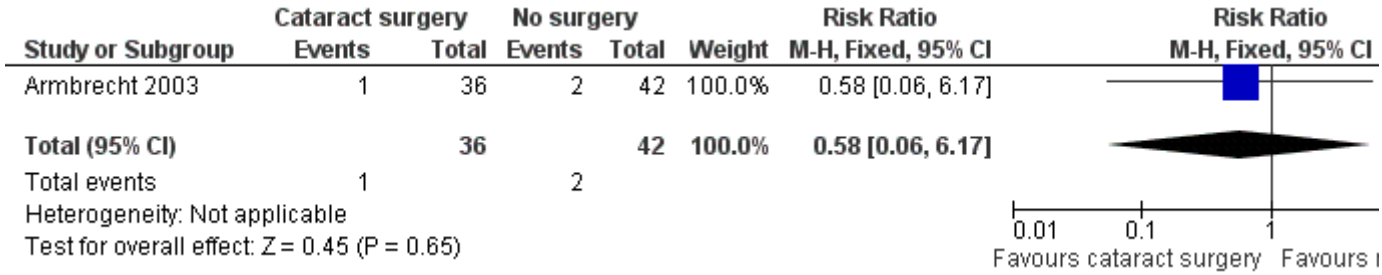
Forest plot of comparison: 1 Visual acuity, outcome: 1.2 visual acuity, observational.

Figure 3 (Analysis 2.1)



Forest plot of comparison: 2 Progression to wet AMD, RCT, outcome: 2.1 Progression to wet AMD, RCT.

Figure 4 (Analysis 2.2)



Forest plot of comparison: 2 Progression to wet AMD, RCT, outcome: 2.2 Progression to wet AMD, observational.

Sources of support

Internal sources

- No sources of support provided

External sources

- No sources of support provided

Feedback

Appendices