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When is refraction stable following routine cataract surgery? A systematic review and meta-analysis

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Abstract

Purpose: We systematically reviewed the literature to investigate when refraction is stable following routine cataract surgery implanting monofocal intraocular lenses. Current advice recommends obtaining new spectacles 4–6 weeks following surgery. Due to advancements in surgical techniques, we hypothesised that refractive stability would be achieved earlier, which could have major short-term improvements in quality of life for patients.

Methods: Medline, CINAHL, AMED, Embase, Web of Science and the Cochrane Library were searched with key words chosen to find articles, which assessed refraction following uncomplicated cataract surgery. Citation chains and the reference lists of all included papers were searched. Unpublished literature was identified using OpenGrey (www.opengrey.eu). The review considered studies that measured refraction at regular intervals following surgery until stability was achieved.

Results: The search identified 6,680 papers. Two reviewers independently screened the abstracts and nine papers were found to fit the criteria, of which five were included in the meta-analysis. The quality of the papers was evaluated using the Methodological Index for Non-Randomised Studies (MINORS) instrument. Meta-analysis of 301 patients' data of spherical, cylindrical and spherical equivalent correction were performed using Review Manager 5 (RevMan 5.3) (https://revman.cochrane.org/). Refraction at 1-week versus the gold standard of 4-weeks showed no significant difference for sphere data (effect size and 95% confidence interval of; ES = 0.00, 95% CI: −0.17, 0.17; $p = 1.00$), cylindrical data (ES = +0.06; 95% CI: −0.05, 0.17; $p = 0.31$), and spherical equivalent (ES = −0.01; 95% CI: −0.12, 0.10; $p = 0.90$). Heterogeneity was non-significant ($I^2 < 25\%$) for all refractive elements. Data were similar for 2- versus 4-weeks post-surgery. Acquired data from one study highlighted a small number of patients with very unstable cylindrical corrections at 1-week post-operatively.

Conclusions: No statistical difference was found when comparing sphere, cylindrical and spherical equivalent values at 1- and 4-weeks post cataract surgery. This suggests that new glasses could be provided 1-week after surgery. However, from a clinical perspective, a small number of patients (~7%) from an acquired dataset ($N = 72$) showed very unstable cylindrical corrections at 1-week. Further work is needed to determine why this is the case and how these patients can be detected.

Introduction

Cataract surgery is the most common surgery performed in the UK, with approximately 400 000 surgeries per year; between 2015–2035 this is anticipated to increase by 50%.[1] Current guidance from the UK Royal College of Ophthalmologists states that new glasses should only be provided 4–6 weeks after surgery.[2] Although there have been great advancements in the surgical procedure of cataract surgery, aftercare guidelines regarding when refraction is stable have not been updated to reflect this. Oshika and Tsuboi assessed the timings of astigmatic and refractive stabilisation following six different surgery procedures.[3] They showed that while 11 mm and 6.5 mm incision sizes did not stabilise for more than 3 months, the 3.2 mm incision group stabilised at 2-weeks post-surgery. With further advancements since this study was published in 1995, incisions are now between 1.8–2.75 mm,[4] and it has been demonstrated that smaller incisions lead to faster refractive stabilisation.[5,6]

There appear to be substantial advantages in providing new glasses quicker than 4–6 weeks. A delay between surgery and the prescribing of new spectacles has been shown not only to be inconvenient to the patient, but may also have a negative effect on their quality of life during the post-operative period.[7-9] This is also exacerbated by the fact that the average age for cataract surgery is decreasing, many patients are still in employment, and there is a much-increased need for near vision in the digital age.[10] Monofocal intraocular lenses (IOLs) are the only IOLs available via the UK National Health Service (NHS); therefore, patients require either new reading or distance glasses for complete visual restoration after surgery. Although patients opting for an emmetropic target refraction may be able to use 'ready-made reading' glasses for close work and reading tasks, those with astigmatism or preferring the convenience of multifocal glasses will struggle. Those patients opting for a myopic target refraction to provide spectacle independence for reading and near tasks (typically patients who are myopic pre-surgery and thus used to being able to read without glasses) will struggle with distance vision tasks such as driving for at least 4-weeks after surgery. Surgeons may also be more open to myopic target refractions if patients can receive spectacles sooner than 4–6 weeks.[11,12] Finally, less time adapting to different spectacles is likely to be beneficial in terms of issues such as falls.[13-16] For example, waiting 4–6 weeks following surgery is sufficient time for patients to adapt to their vision with whatever correction they wear post-surgery (if any) and patients then need to re-adapt to any new spectacle correction (i.e. two adaptation periods).[14] Obtaining spectacles just 1-week post-surgery would likely lead to just one adaptation period.[14]

We hypothesised that refractive error stabilises after cataract surgery quicker than the current guidelines of 4–6 weeks suggests and this was tested using a systematic review and meta-analysis. The results of this analysis can be used to determine whether post-operative refraction guidelines need to be revised.

Methods

Search strategy and inclusion criteria

To make the research process transparent a protocol was set out in advance. Medline, CINAHL, AMED, Web of Science, Embase and the Cochrane Library were searched up to 1 August 2019 using the key words listed in Table 1. Reference lists of all included papers were hand searched along with the citation chains of the papers using Google Scholar. To reduce publication bias[17] unpublished literature was searched using OpenGrey (www.opengrey.eu). Papers not published in English were not included in the review as no translation services were available. The study's inclusion criteria were:

- Adults undergoing routine, uncomplicated cataract surgery for age-related cataracts.
- Manual cataract surgery via clear corneal incision.
- Cataract aspirated using phacoemulsification.
- Sutures not required to close the corneal incision.
- Monofocal IOLs implanted.
- Refraction measured within 1-week of surgery either subjectively or objectively and at regular intervals until 4-weeks after surgery.
- Conducted in an upper-middle-income or high-income economic country (defined by the World Bank as a Gross National Income (GNI) per capita between \$3,995 and \$12,376).[18]
- Printed in English.

The exclusion criteria were:

- Pre-existing ocular co-morbidities.
- Toric IOLs implanted.
- Femtosecond laser-assisted cataract surgery.

If a study compared different surgical techniques, they were included in the review but only data relevant to our specific surgical technique was included.

Paper selection

Two reviewers (EC and AA) independently searched the databases using the defined strategy. Title and abstracts were screened by the two reviewers to assess if they met the criteria. Each reviewer produced a list of papers that were then compared, and any paper identified by one reviewer was assessed by another researcher (DE) who made the final decision on inclusion of the paper. Both EC and AA read the identified papers in full before making a final decision on eligibility. The final list of papers was compared once again, with any discrepancies re-read by DE. EC and

Table 1. Table showing how the search terms were combined during the initial database searching

Search Terms					
'Cataract Surgery'	AND	Stable	AND	Refracti*	Optometrist*
Cataract		Stabili*		Spectacle*	Vision
'Cataract extraction'				Eyeglass*	"Visual acuity"
IOL				Glasses	
Phacoemulsification				"Spectacle prescription"	
'Intraocular lens'				Optometry	

The process was started to register the review with PROSPERO (https://www.crd.york.ac.uk/PROSPERO/). At that time, the protocol could be submitted if the reviewers had not completed their data extraction. PROSPERO changed this to only accept reviews where data extraction had not yet started and the protocol became no longer eligible to be published.

*Denotes a search for any word that begins with these letters.

AA manually screened the reference lists and citation chains of each included paper. All papers were stored in Endnote and checked for duplicates. A PRISMA flow diagram was used to document each step (Figure 1).

Quality assessment of studies

Data extraction forms were created using the Critical Appraisal Skills Programme (CASP) quality assessment tool guidelines.[19] Data extraction forms were completed independently by EC and AA for all of the included papers, with any disagreements resolved with the assistance of DE.

The quality of the papers was evaluated using the first eight items (those relating to observational and non-comparative studies) of the Methodological Index for Non-Randomised Studies (MINORS).[20] Each question was scored on a 3-point scale from 0 to 2, with zero being used if the item was not reported in the study, 1 if the item was reported but not adequately, and 2 if the reporting of the item was adequate, giving a range of 0 to 16. Each study was independently scored by three reviewers with any discrepancy being resolved by discussion. The MINORS scores of quality assessment are presented in Tables 3 and 4.

Data extraction and analysis

Mean refraction data (spherical, cylindrical and spherical equivalent, SE) were extracted from each paper at all time intervals and included with the standard deviation (SD) and number of participants into an Excel spreadsheet. Cylindrical data were converted into minus cylinder format if required before analysis. Sphere and cylindrical data from an individual study were *not* combined to create SE data (sphere + [0.5 * cylinder]) as the SD of SE could not be accurately derived. Refraction data were compared at 1-week vs 4-weeks, and 2-weeks vs 4-weeks. Four weeks was chosen as the refractive comparison as it is the earliest time point at which the Royal College of Ophthalmologists recommend updating spectacles following surgery. It also allowed a more comprehensive meta-analysis as no studies measured refraction 6-weeks following surgery. Effect sizes (ES) were derived from each study using the mean, SD and N already extracted using the procedures outlined by Hedges and Olkin.[21] The mean difference was used to combine the two variables (refraction at 1-week and 4-weeks). Pooled SD and 95% confidence interval (CI) were derived.[21] The ES calculations were performed using Review Manager (RevMan 5.3) (https://revman.cochrane.org/). 22 The ES provides the absolute measure of the difference between the two groups in the study and an ES of 0 was indicative of no difference between refraction at 1-week vs 4-weeks or 2-weeks vs 4-weeks. The overall ES was determined by considering the ES of all the studies using a weighted fixed effects model. Initial inspection of our data suggested no variability in ES between studies; therefore, a fixed effect rather than a random effects model was used.[23] A fixed effect model can be used when studies are considered to have the same design and methodology. The variance within the studies is small and is thought to be due to random error therefore the model assumes that the effect is the same within the studies.[24] The contribution of each study ES to the overall weighted ES was determined by the inverse variance-weighted estimation as described by Hedges and Olkin.[21]

Homogeneity tests were conducted to evaluate if the degree of heterogeneity was greater than would be expected to occur by chance.[24] The Cochran's Q test (chi-squared) and the Higgins I^2 statistics were calculated. To calculate the *p*-value of the chi-squared test the null hypothesis assumed all studies were homogeneous. A significant Q value indicates the variability in the ES among the studies is more than can be accounted for due to sampling error. For the Q statistic, the p-value from the chi-squared test calculated from the Forest plot has to be less than 0.1 to show statistical heterogeneity.[23] I^2 provides an indication of the total variability among the ES and produces a value

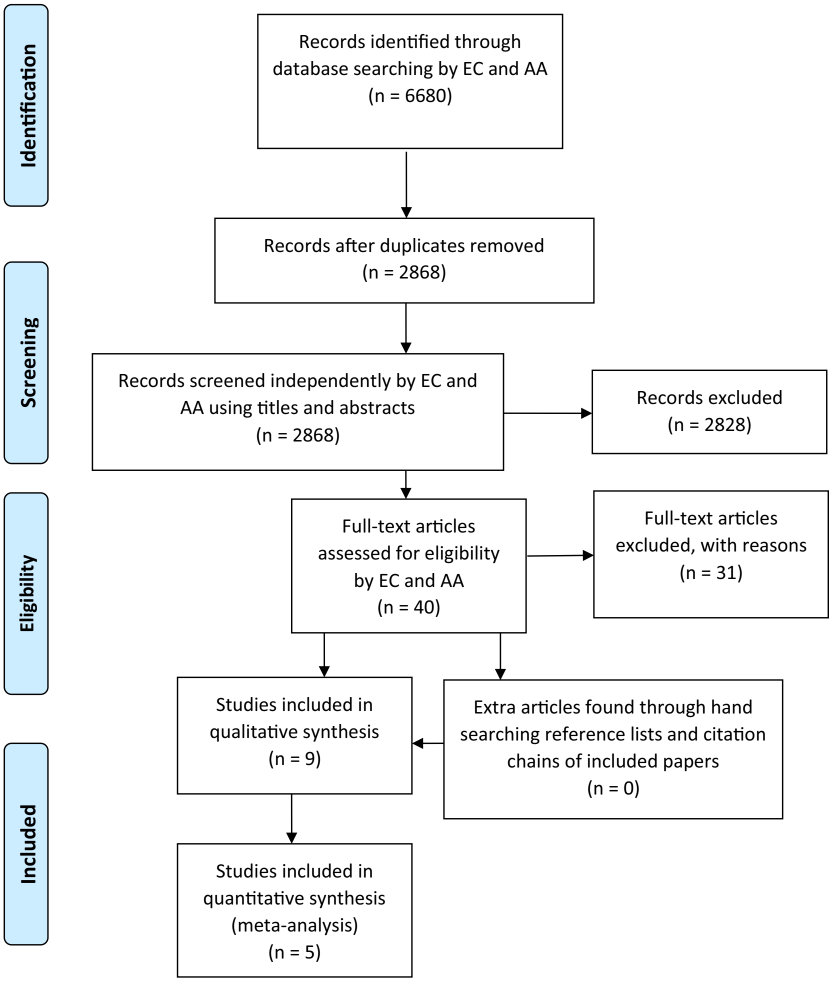

Figure 1. PRISMA flowchart showing the number of papers at each stage of the review process.

between 0–100%. A value greater than 75% indicates strong heterogeneity, 50% is average, and less than 25% indicates strong homogeneity.[23] The significance of the summary effect size of the meta-analysis was calculated using a two-tailed Z test (effect size/standard error) of the null hypothesis that time had no effect on refraction. A Z table was then used to find the corresponding p-value.

Results

Initial searching identified 6680 papers, with 3812 of these duplicates, leaving 2,868. Title and abstract screening determined 40 of these should be read in full, as they initially appeared to satisfy the inclusion and exclusion criteria. After reading the studies, 31 papers were excluded with the reasons why listed in Table 2. Nine papers were found to assess refractive stability by either automated or subjective refraction following uncomplicated phacoemulsification cataract surgery and are listed in Tables 3 and 4.[3,9,25-32] Three studies gave no details of how refraction was measured.[26,29,30]

Five of the studies attempted to determine when refraction was stable following cataract surgery. Two studies compared standard phacoemulsification with femtosecond laser assisted cataract surgery. The remaining two studies assessed IOL selection choice. Two studies were conducted in the United States, and one each in the United Kingdom, Germany, Spain, Japan, Denmark, Italy and Turkey.

Four studies were omitted from either the 1-week vs 4-weeks meta-analysis or 2-week vs 4-weeks meta-analysis, with the reasons for non-inclusion provided in Table 3. They were still included in the systematic review as part of a qualitative analysis.

Five studies (301 eyes) were included in the meta-analysis as they compared refraction at 1-week vs 4-weeks and included the relevant SE (three), spherical (one) and cylindrical (three) data and are summarised in Table 4. We contacted one author for clarification of their data as the data

Table 2. Reason for rejection of papers from the systematic review

Reason for rejection of paper	Number of papers rejected
Incorrect surgical technique	9
Refraction not measured at 1-week and up to 4-weeks after surgery	7
Refraction not measured	4
Paper not written in English	4
Abstract only	4
Not routine surgery	1
Toric IOL	1
Low economic country	1

included in the text did not match the table.[25] No clarification was received so the spherical data from the paper were excluded.

Potentials for bias

For most studies, cataract surgery was only conducted at one hospital, with one exception.[25] This makes it difficult to say whether the patients at each of these hospitals were representative of the general population. Depending on healthcare systems in different countries and areas, patients may have to reach a certain level of visual acuity (VA) or cataract density before receiving surgery, which may have resulted in selection bias for surgery. Eight studies had a prospective design, however only Toto *el al*[31] attempted to calculate a prospective study size. Few discussed how many patients were excluded due to the tight inclusion and exclusion criteria.[28,30,32] This information is critical to know how applicable the findings are to the general population. How and who measured refraction has the potential to bias the study endpoint. If refraction was measured subjectively, the optometrist should be blind to the previous refraction and the MINORS results reflect this. Edwards *et al.*[28] was the only study to mention that an independent observer conducted the subjective refraction. Despite the refractive correction being the main outcome for the listed studies (Table 4), in most reports it was described in a nominal way ("manifest refraction").[26,29,30]

Studies not included in the meta-analysis

Four studies were not included in the meta-analysis with reasons why listed in Table 3. Data were excluded from Caglar *et al.*[25] due to errors in the spherical and cylinder data. The mean and standard deviation (SD) of the cylinder powers are confusing and suggest that some of the data were in minus cylinder form and other data in plus cylinder form. If so, this would have also produced variability in the spherical powers due to transposition differences with plus or minus cylinder (e.g.+4.00/−2.00 × 90 is equivalent to +2.00/+2.00 × 180). We attempted to contact the authors to query these issues but did not receive a response. They concluded spectacles could be prescribed 2-weeks following uneventful cataract surgery. The remaining three studies[27,28,32] concluded refraction was stable after 1-week. De Juan grouped together mean and SD using data from both eyes of most patients,[22] without correction for the lack of independence of right and left eye data.[16] We contacted the lead author, but the full data set was not available and the data could not be separated into right and left eye data. Ostri *et al.*[32] compared automated refraction 1-week and 1-month after uncomplicated surgery and while they noted there was no change between sphere and SE the cylinder increased and was not stable after 1-week. This study, however, was not included in the meta-analysis as only the mean and SD of the change in refraction was provided and, therefore, an effect size could not be calculated for this study.

Studies included in the meta-analysis

The ES of all five papers (green square symbols, size of square representative of weighting) along with the combined ES (diamond symbol) are shown in the Forest plots in Figure 2. The plot shows the ES of time (1-week vs 4-weeks) on refraction with an ES of 0 indicating time had no effect on refraction. The ES, Q statistics and I^2 statistics for SE data were ES = −0.01 (95% CIs of −0.12 and 0.10; $Z = 0.13$ $p = 0.90$), $Q = 0.03$ ($p = 0.99$), $I^2 = 0\%$; spherical data: 0.00 (95% CIs of −0.17 and 0.17; $Z = 0.0$ $p = 1.0$); cylindrical data: ES = +0.06 (95% CIs of −0.05 and 0.17; $Z = 1.02$ $p = 0.31$), $Q = 1.18$ ($p = 0.55$) and $I^2 = 0\%$. All p-values indicate there was no evidence of time having an effect on refraction, with I^2 values showing high homogeneity across all studies.

The lack of statistical significance found between the data at 1-week and 4-weeks could be due to a lack of sufficient data to detect a true difference (a type 2 error or false negative). The statistical power of the meta-analysis was calculated using the method described by Valentine *et al.*[33] using the smallest meaningful difference of 0.25D, a type 1 error rate (alpha) of 5% and a two-tailed test to analyse for a significant effect in either direction. The estimated statistical power of the meta-analysis was 99.2% for SE (three studies of mean $N = 64$), 81.8% for sphere (one study, $N = 100$) and 99.4% for cylinder (three studies of mean $N = 70$). The power of the study to find a 0.25D difference is therefore greater than the traditionally acceptable 80% power and the possibility of a type 2 error (false negative) for SE and cylinder is very small at ~0.7%.

A meta-analysis for 2-weeks vs 4-weeks was also conducted and the results were consistent with the 1-week vs

Table 3. Papers that were included in a qualitative analysis but not the quantitative meta-analysis

Paper	Study design	N	Refraction details	Time intervals of refraction	MINORS score*	Reason for non-inclusion	VA measurement	Surgical Technique	Conclusions regarding refractive stability
Caglar et al. (2017)[25]	P	62	Automated, sphere and cylinder	1 day, 1-week, 2-weeks, 1 month	10	Data errors in spherical data, cylinder appears to have been measured in plus and minus cyl format	Not stated	2.8 mm temporal incision	Possible to prescribe glasses 2 weeks after uneventful surgery
de Juan et al. (2013)[27]	P	124	Mean of 3 autorefractor (ARK-30) results	Pre-op, 1-week, 2, 3 & 4-weeks	8	Provided mean and SD data using data from both eyes	Not stated	2.75 mm incision at 11 o'clock	Can prescribe spectacles at 1-week post-op
Edwards et al. (1997)[28]	P	88	Subjective refraction by an optometrist, sphere, cylinder and axis	1–2 weeks and 3–4 months	11	Only mean and SD of change provided	Snellen	3.2–3.5 mm incision	Can prescribe spectacles at 1-week post-op
Ostri et al. (2018)[32]	P	95	Automated refraction, sphere, cylinder and SE	6–9 days and 3–5 weeks	11	Only mean and SD of change provided	Not stated	2.4 mm incision at limbus	Sphere and SE Automated refraction is stable 1-week after surgery

Key: P: prospective; SE: Spherical equivalent, SD: standard deviation; VA: visual acuity.
*MINORS was scored out of 16.

Table 4. Papers included in the 1-week vs. 4-weeks or 2-weeks vs. 4-weeks meta-analysis

Paper	Study design	N	Method of refraction	Time intervals of refraction	MINORS score*	VA measurement	Surgical Technique	Conclusions regarding refractive stability
Conrad-Hengerer et al. (2015)[26]	P	100	"manifest refraction"	Pre-op, 2 h, 3 days, 1-week, 1, 2, 3 & 6 months	6	LogMAR converted to decimal	2.75 mm at steepest meridian	Not applicable – different research question
Lyle et al. (1996)[29]	P	50	"manifest refraction"	30 mins, 1 day, 1-week, 1 & 3 months	7	Snellen converted to decimal	3.25 mm incision	Not applicable – different research question
Oshika et al. (1995)[3]	P	52	Objective refraction, SE & corneal astigmatism (based on keratometry)	Pre-op, post-op, 1 & 2 weeks, 1, 3 & 6 months	5	Not stated	3.2 mm incision at 12 o'clock	Spherical equivalent stable at 2-weeks
Sugar et al. (2001)[30]	R	59	"manifest refraction" (SE not used as SDs not provided), cylinder and axis	Post-op, 1-week, 1 & 4 months	8	Snellen converted to LogMAR, averaged, converted back to Snellen	3.5 mm temporal incision	Refractive error stabilised at 1-week in 80% of eyes
Toto et al. (2015)[31]	P	40	Subjective refraction, SE	7, 30 & 180 days	11	LogMAR	2.75 mm incision	Not applicable - different research question

Key: P: prospective; R: retrospective; SE: spherical equivalent, SD: standard deviation; VA: visual acuity.
*MINORS was scored out of 16.

4-weeks meta-analysis, although there was only one set of data for each of spherical, SE and cylinder so that these are not shown. A funnel plot is normally used to check for the presence or absence of publication bias. The power of the test can be too low to distinguish chance from real asymmetry with less than 10 studies so no plot was included.[34]

Discussion

The results of the qualitative analysis and meta-analysis strongly suggest that refraction is stable 1-week following routine cataract surgery, with the meta-analysis having relatively high statistical power. However, this analysis pertains to group data and not individual patients, so further investigation of possible outcomes for individual patients was performed.

Edwards *et al.*[28] discharged 88 patients with a prescription for new glasses 1-week after surgery and they returned 3–4 months later where a refraction by an independent clinician was performed and any patients with improved VA who wished to change, obtained new glasses. Eighty-four out of the 88 participants had a stable spectacle prescription (95%), with just four receiving new glasses. The average non-tolerance rate for all new glasses provided in optometric practices is approximately 2%,[35] so non-tolerance to spectacles from two of the four patients in the Edwards study could be expected.

We contacted the lead author of several papers and asked whether they would be willing to share their data, if it was still available, and a previous version of the dataset from de Juan *et al.*[27] was provided (N = 72). These data were

Table 5. Refractive corrections (rounded to nearest 0.25DC and 5 degrees) from a subset (N = 72) of the data from de Juan *et al.*[22] at pre-operative, 1-week and 4-week visits for those corrections that changed between 1-week and the gold standard 4-weeks by more than 0.75DC

	Pre-operative	1-week	4-week
1	−3.25/−1.75 × 120	+3.25/−3.25 × 145	+1.25/−1.50 × 100
2	+3.50/−1.75 × 85	+0.75/−2.00 × 90	−0.50/−0.50 × 95
3	+1.25/−0.50 × 170	+3.00/−2.00 × 95	+0.25/−0.25 × 100
4	+2.75/−4.00 × 80	+3.25/−8.25 × 70	+1.25/−2.00 × 85
5	−13.00/−3.50 × 175	+0.25/−5.00 × 60	−0.25/−2.00 × 120

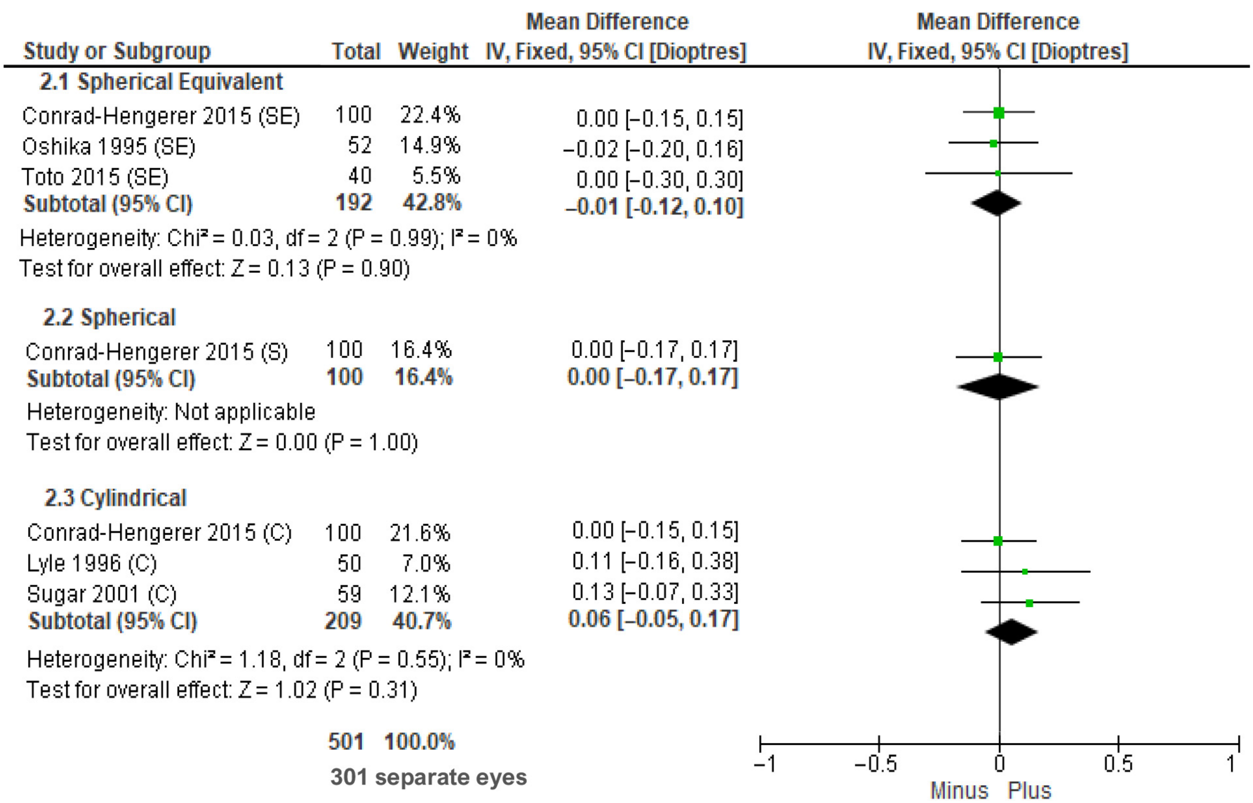

Figure 2. A Forest plot of weighted effect size for the five studies at 1-week and 4-weeks. Each study's individual effect size is represented by the green square with the size of the square relative to the weight of the study. Error bars signify 95% confidence intervals. Combined effect size is given by the diamond for each subgroup. The vertical line at zero indicates time had no effect on refraction.

assessed using a clinical approach to determine if there were any patterns in those patients whose post-operative refractive corrections (determined by autorefractor) that did not seem to have stabilised at 1-week. At 1-week 94% and 89% of patients were within 0.50DS and 0.50DC of their spherical and cylindrical refraction at 4-weeks respectively. However, five of 72 (7%) corrections had differences between post-operative cylinder at 1- and 4-weeks of more than 0.75DC and these are shown in Table 5. Given that the mean cylinder change from pre-op to 1-week is +0.38 with the majority of patients having no change or a reduction in cylindrical power (64 of 72 were 0.50DC or less, 89%) it is notable that four of the five outliers showed large increases in cylinder power (−1.80DC) and/or large changes in axis (46 degrees). In addition, there are no patients with relatively stable corrections (i.e. 1-week to 4-weeks less than 0.75DC) whose cylindrical correction increased significantly between pre-op and 1-week. We propose that major cylindrical power and/or axis changes from pre-operative to 1-week corrections suggest that refractive stability has not yet occurred, and the correction should not be prescribed. It is possible that some of these large changes were partly due to the use of autorefraction rather than subjective refraction to determine refractive change.

Future research

Further research is required to attempt to find associated factors that could help clinicians in differentiating between those patients that can be prescribed glasses at 1-week from the relatively small number who may take longer to stabilise and should obtain a spectacle prescription later. Some surgeons attempt to correct astigmatism during surgery by selective positioning of the phacoemulsification incision, limbal relaxation incisions or corneal relaxing incisions,[36] but these were not reported to have been used in any of the studies listed. Further investigation is needed to assess how this would impact refractive stability.

Limitations

The studies included provided very limited descriptions of the refraction and this was generally described as "manifest refraction" only. The meta-analysis of the cylindrical data may be limited in that the cylinder data are skewed, yet were incorporated into the meta-analysis from means and standard deviations (i.e. assuming a normal distribution). The meta-analyses were also limited by two factors: the relatively small number of studies and patients, with only one study and an N of 100 for sphere only data (Figure 2). The results will only be applicable for the surgical technique and incision sizes used (Table 4).

Conclusion

All of the papers included in this review showed refraction was stable sooner than the current guidelines of 4–6 weeks following surgery.[3,25-32] Those evaluating the ideal time for updated spectacles concluded they could be safely prescribed either 1- [27,28] or 2-weeks[25] after surgery. A meta-analysis of five studies (301 eyes) showed no statistical difference between spherical, spherical equivalent and cylindrical refraction between 1-week and the current standard of 4-weeks (Figure 2) and was shown to have high statistical power. The study by Edwards *et al*., and the analysis of the subset of the de Juan data described here, indicate that in a small number of individual patients (<10%) their refractive error had not stabilised after 1-week; further work is needed to determine why this was the case and how these patients can be detected. The de Juan data suggest that a large increase in cylinder from pre- to post-surgery is an indicator that refractive stability has not occurred and these patients should not be prescribed new glasses and should be monitored. This also needs to be further evaluated.

Disclosure

The authors report no conflicts of interest and have no proprietary interest in any of the materials mentioned in this article.

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