Irish Journal of Medical Science (1971 -) (2019) 188:1021–1024
https://doi.org/10.1007/s11845-018-1908-9

ORIGINAL ARTICLE

Migration to aphakia and contact lens treatment is the trend in the management of unilateral congenital cataract in Britain and Ireland

Lisa McAnena[1] · Kathryn McCreery[1] · Donal Brosnahan[1]

Received: 13 September 2018 / Accepted: 21 September 2018 / Published online: 29 September 2018

Abstract

Background The Infant Aphakia Treatment Study (IATS) compared the treatment of unilateral cataract in infants aged 1–6 months with primary intraocular lens (IOL) implantation vs aphakia with contact lens (CL) correction.

Aims This study aims to assess the current trends in the treatment of unilateral congenital cataract in infants less than 6 months at surgery in the UK and Ireland.

Methods An anonymous survey was emailed to the 200 members of the BIPOSA mailing list with 14 questions to assess treatment choice (primary intraocular lens (IOL) vs aphakia with contact lens (CL)), reasons for this choice, and assessment of local CL services.

Results There were 56 respondents, 39 of whom completed the entire survey. Aphakia with CL was the treatment choice for 74.4% of respondents. A quarter (25.6%) of respondents said they were performing primary IOL implantation prior to the publication of the Infant Aphakia Treatment Study (IATS), but now choose aphakia with CL. Amongst the 20.5% ($n = 8$) of respondents who chose primary IOL implantation, 5 attributed their choice to "inadequate CL service". The majority (84.6%) of respondents rated their infant CL service as either "good" or "very good".

Conclusion Aphakia with CL rehabilitation was the most common approach to the treatment of unilateral congenital cataract in infants less than 6 months in this study. The results of the IATS appear to have influenced a change in practice from primary IOL implantation to aphakia and CL visual rehabilitation in approximately one quarter of those surveyed.

Keywords Congenital cataract · Ophthalmology

Background

The management of unilateral congenital cataract has historically been both challenging and controversial. In the past, visual outcomes were so poor that surgery was deemed inadvisable [1]. Subsequent advances in surgical technique and intraocular lens (IOL) technology resulted in improved outcomes, and primary IOL implantation became the desired standard of care [2, 3]. However, primary IOL implantation before the age of 6 months is associated with a high rate of complications and reoperations [4, 5].

The Infant Aphakia Treatment Study (IATS) is a multicentre, randomised controlled clinical trial comparing treatment of unilateral cataract in infants aged 1–6 months with primary (IOL) implantation vs aphakia with contact lens (CL) correction; the 5-year results of which were published in 2014 [6]. The results demonstrated comparable visual outcomes and rates of glaucoma and strabismus between the two groups at 5 years [6–9]. However, there were higher rates of adverse events, complications and additional intraocular surgeries in the primary IOL group, thus leading the authors to advocate for aphakia and

✉ Lisa McAnena
lmcanena@yahoo.co.uk

Kathryn McCreery
kathrynmccreery@gmail.com

Donal Brosnahan
brosn@gmail.com

[1] Our Lady's Hospital for Sick Children, Crumlin, Dublin, Ireland

contact lens application if it was considered likely that the family could comply with this treatment [10].

Aims

The aim of our study is to assess the current trends in the treatment of unilateral congenital cataract in infants less than 6 months at surgery in the UK and Ireland in the wake of the publication of the IATS, and to assess the influence of this study, if any, on treatment choice.

Methods

We sent an anonymous survey to the 200 members of the British Isles Paediatric Ophthalmology and Stabismus Association (BIPOSA) email list in November 2016 and again in April 2017. The survey was created using the SurveyMonkey® [11] platform and comprised of 14 multiple-choice questions, assessing surgeon age, grade, location within the British Isles, type of unit (e.g. ophthalmic hospital vs paediatric hospital), annual number of unilateral congenital cataract procedures performed in infants less than 6 months, treatment choice (primary IOL vs aphakia with CL), reasons for this choice, and assessment of local contact lens services. The data were analysed by the primary author. The study was carried out in accordance with the principles contained in the Declaration of Helsinki.

Results

The baseline characteristics of the respondents are found in Table 1. There were 56 respondents, 39 of whom completed the entire survey. Fifty-five (98.2%) of the respondents were consultant grade, with one fellow. The majority (78.6%), were between 41 and 60 years of age. Just over half of respondents practice in ophthalmic hospitals and the majority (74%) of units were based in England.

Most of these units experience low rates of unilateral congenital cataract in infants less than 6 months, with 68% reporting 0–10 cases annually.

A summary of treatment choices and factors influencing these choices is found in Table 2. Aphakia with CL was the preferred treatment choice in the majority (74.4%) of respondents. When asked why they chose this treatment, 62% chose "based on the results of the Infant Aphakia Treatment Study" as their response, vs 38% who chose "personal experience".

Amongst the 20.5% ($n = 8$) of respondents who chose primary IOL implantation, 5 attributed their choice to "inadequate CL service", while the remaining 3 respondents stated "personal experience" as their reason. Amongst those who practice aphakia with CL, 74% insert a secondary IOL only in cases of poor CL compliance or CL failure, while 22% of these respondents always implant a secondary IOL.

In cases of good CL compliance, 44.4% of respondents implant a secondary IOL at 5 years or more, while 22.22% never implant a secondary IOL in these cases.

Respondents were asked whether the results of the IATS had changed their practice management of unilateral congenital cataracts. Of the 39 respondents to this question, 48.7% chose the answer "No, I was practicing aphakia with contact lens treatment prior to the publication of the IATS anyway" while 25.6% chose the answer "Yes, I used to implant primary IOLs, now I practice aphakia and contact lens treatment". A further 17.9% chose "No, I continue to insert primary IOLs as I did before the publication of the study "while no respondents answered "Yes, I used to practice aphakia and contact lens treatment, now I implant primary IOLs".

Table 3 summarises the results of CL compliance and service questions. When asked about their experience of poor CL

Table 1 Number of respondents, respondents' grade, hospital type, hospital location, and annual number of congenital cataracts performed at their respective hospitals

Respondents $n = 56$	*Complete* 39 (69.6%)				
Grade $n = 56$	*Consultant* 55 (98.2%)	*Fellow* 1 (1.8%)			
Age (years) $n = 56$	*20–30* 0 (0%)	*31–40* 8 (14.3%)	*41–50* 21 (37.5%)	*51–60* 23 (41.1%)	*> 60* 4 (7.1%)
Hospital type $n = 49$	*Ophthalmic* 10 (0.4%)	*General* 26 (53.1%)	*Paediatric* 13 (26.5%)		
Hospital location $n = 50$	*England* 37 (74%)	*Scotland* 7 (14%)	*Wales* 4 (8%)	*Northern Ireland* 1 (2%)	*Republic of Ireland* 1 (2%)
Total number of annual congenital cataracts $n = 50$	*0–10* 29 (58%)	*10–50* 15 (30%)	*50–100* 5 (10%)	*100–200* 1 (2%)	
Total number of annual unilateral congenital cataracts $n = 50$	*0–10* 34 (68%)	*10–50* 13 (26%)	*50–100* 1 (2%)	*100–200* 1 (2%)	

Table 2 Treatment choices and factors influencing these choices

In unilateral cataracts age < 7 months, what is your preferred option? $n = 39$	*Primary IOL implantation* 8 (20.5%)	*Aphakia and contact lens treatment* 29 (74.4%)	*Other* 2 (5%)				
If you answered a) primary IOL implantation, please tell us why? $n = 8$	*Personal experience* 3 (37.5%)	*Inadequate CL service* 5 (62.5%)					
If you answered b) Aphakia and contact lens treatment please tell us why? $n = 29$	*Based on results of the IATS* 18 (62%)	*Personal experience* 11 (38%)					
If you practice aphakia with contact lens treatment, do you insert a secondary IOL? $n = 27$	*All cases* 6 (22.2%)	*Poor CL compliance only* 20 (74.1%)	*Never* 1 (3.7%)				
In patients with GOOD CL compliance, when do you tend to insert your secondary IOL? $n = 27$	*< 1 year* 0 (0%)	*1–2 years* 4 (14.8%)	*2–3 years* 3 (11.1%)	*3–4 years* 0 (0%)	*4–5 years* 2 (7.4%)	*> 5 years* 12 (44.4%)	*Never* 6 (22.2%)
Have the results of the IATS study changed your practice management in treatment of unilateral cataracts age < 7 months? $n = 39$	*Yes, I used to implant primary IOLs, now I practice aphakia and contact lens treatment* 10 (25.6%)	*Yes, I used to practice aphakia and contact lens treatment, now I implant primary IOLs* 0 (0%)	*No, I was practicing aphakia with contact lens treatment prior to the publication of the IATS anyway* 19 (48.7%)	*No, I continue to insert primary IOLs as I did before the publication of the study* 7 (17.9%)	*Other* 3 (7.7)		

compliance in aphakic patients, 53.8% reported "sometimes" while 7.7% chose "very often". The majority (84.6%) of respondents rated their infant CL service as either "good" or very good", with 5% rating it as "absent" and 7.7% rating it as "poor".

Discussion

In the prospective cohort "IoLUnder2" study of congenital and infantile cataracts in the first 2 years of life in the UK and Ireland, the British Isles Congenital Cataract Interest Group (BCCIG) reported 103 unilateral congenital cataract surgeries performed amongst 69 surgeons between January 2009 and December 2010 [12]. Of these 103 cases, 55 (53.4%) had primary IOLs while the remaining cases were left aphakic with CL. The study did not report subgroup results for unilateral cataracts age 1–6 months, however.

Aphakia and CL treatment was the most common surgical approach in the treatment of unilateral congenital cataract amongst the respondents to our survey. While approximately half of our overall respondents were practicing this approach prior to the publication of the IATS, a further one quarter changed their practice from primary IOL implantation to aphakia with CL following the results of the IATS, published in 2014 [6].

Primary IOL implantation is practiced amongst 20.5% of our respondents, with just over half of these reporting poor CL services as a reason for this choice. There were variable trends in the implantation of secondary IOLs and the majority of respondents reported a "good" or "very good" CL service.

Long-term results from the BCCIG will likely give a more accurate measure of current practice trends in this area.

Table 3 Assessment of patient contact lens compliance and local contact lens services

In aphakic patients, do you experience patients with poor CL compliance $n = 39$	Never 1 (2.6%)	Rarely8 (20.5%)	Sometimes 21 (53.8%)	Often5 (12.8%)	V often 3 (7.7%)	Not applicable 1 (2.6%)
How would you describe your local infant CL service? $n = 39$	Absent 2 (5.2%)	Poor 3 (7.7%)	Good 15 (38.5%)	Very good 18 (46.2%)	Not applicable 1 (2.6%)	

One weakness of our study is the possible over simplification of answer choices to what can often be complex clinical cases that are not easily addressed by a binary "to implant or not to implant" choice. The IATS examined a relatively homogenous group of patients with no other co-morbidities such as microphthalmia or persistent foetal vasculature (PFV). The patients in that study also had access to the highest standard of CL care as part of the study protocol [13].

In real clinical practice, things are often not so straightforward. This is illustrated in some of the responses given in the free text area of the survey, for example, "There are many factors which affect my decision, many unilateral cataracts are associated with PFV and mild microphthalmia - I don't implant these until a year. If the parents live a long drive away from me I may opt for a primary IOL from 6 months of age" and

"I sometimes will use a lens and sometimes use CL it depends how old they are, i.e. 6 weeks or 6 months makes a big difference in axial length, whether there is associated PFV". Indeed, in some developing countries, primary IOL may be the superior option due to lack of adequate CL services [14, 15].

A further weakness is the subjective nature of the survey format.

In the era of evidence-based medicine, high-quality RCTs are often pivotal in answering the most challenging dilemmas in clinical practice and can influence changes in practice trends in many medical spheres. To the best of our knowledge, this is the first study to examine the practice trends in the treatment of unilateral congenital cataract in infants less than 6 months in the UK and Ireland following the publication of the IATS. We had a relatively good response rate, 56 respondents out of 200 surveyed, with 39 completing the full survey.

Conclusion

Aphakia with CL visual rehabilitation is the most common treatment option selected for unilateral congenital cataract in infants less than 6 months old in our survey. The results of the IATS appear to have influenced a change in practice from primary IOL implantation to aphakia and CL visual rehabilitation in approximately one quarter of those surveyed.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Ryan SJ, Maumenee AE (1977) Unilateral congenital cataracts and their management. Ophthalmic Surg 8(5):35–39
2. Wilson ME Jr, Trivedi RH, Buckley EG, Granet DB, Lambert SR, Plager DA et al (2007) ASCRS white paper. Hydrophobic acrylic intraocular lenses in children. J Cataract Refract Surg 33(11):1966–1973
3. Wilson ME (1996) Intraocular lens implantation: has it become the standard of care for children? Ophthalmology 103(11):1719–1720
4. Lambert SR, Buckley EG, Plager DA, Medow NB, Wilson ME (1999) Unilateral intraocular lens implantation during the first six months of life. J AAPOS 3(6):344–349
5. Lambert SR, Lynn M, Drews-Botsch C, Loupe D, Plager DA, Medow NB, Wilson ME, Buckley EG, Drack AV, Fawcett SL (2001) A comparison of grating visual acuity, strabismus, and reoperation outcomes among children with aphakia and pseudophakia after unilateral cataract surgery during the first six months of life. J AAPOS 5(2):70–75
6. Lambert SR, Lynn MJ, Hartmann EE, DuBois L, Drews-Botsch C, Freedman SF et al (2014) Comparison of contact lens and intraocular lens correction of monocular aphakia during infancy: a randomized clinical trial of HOTV optotype acuity at age 4.5 years and clinical findings at age 5 years. JAMA Ophthalmol 132(6):676–682
7. Bothun ED, Lynn MJ, Christiansen SP, Neely DE, Vanderveen DK, Kruger SJ, Lambert SR (2016) Sensorimotor outcomes by age 5 years after monocular cataract surgery in the Infant Aphakia Treatment Study (IATS). J AAPOS 20(1):49–53
8. Hartmann EE, Stout AU, Lynn MJ, Yen KG, Kruger SJ, Lambert SR (2015) Stereopsis results at 4.5 years of age in the infant aphakia treatment study. Am J Ophthalmol 159(1):64–70.e1–2
9. Freedman SF, Lynn MJ, Beck AD, Bothun ED, Orge FH, Lambert SR (2015) Glaucoma-related adverse events in the first 5 years after unilateral cataract removal in the Infant Aphakia Treatment Study. JAMA Ophthalmol 133(8):907–914
10. Plager DA, Lynn MJ, Buckley EG, Wilson ME, Lambert SR (2014) Complications in the first 5 years following cataract surgery in infants with and without intraocular lens implantation in the Infant Aphakia Treatment Study. Am J Ophthalmol 158(5):892–898
11. [Available from: www.surveymonkey.com
12. Solebo AL, Russell-Eggitt I, Cumberland PM, Rahi JS (2015) Risks and outcomes associated with primary intraocular lens implantation in children under 2 years of age: the IoLunder2 cohort study. Br J Ophthalmol 99(11):1471–1476
13. Russell B, DuBois L, Lynn M, Ward MA, Lambert SR (2017) The Infant Aphakia Treatment Study contact lens experience to age 5 years. Eye Contact Lens 43(6):352–357
14. Trivedi RH, Wilson ME, Vasavada AR, Shah SK, Vasavada V, Vasavada VA (2011) Visual axis opacification after cataract surgery and hydrophobic acrylic intraocular lens implantation in the first year of life. J Cataract Refract Surg 37(1):83–87
15. Bowman RJ, Kabiru J, Negretti G, Wood ML (2007) Outcomes of bilateral cataract surgery in Tanzanian children. Ophthalmology 114(12):2287–2292