Depot steroid injection during cataract surgery prevents the need for district nurse visits to patients unable to instil their own eye drops

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Abstract

There are over 400,000 cataract operations now being performed annually in the UK. With the majority of those patients being elderly, co-morbidities such as dementia or arthritis can prevent patients putting in their own post-operative eye drops. Where there is a lack of family or other support, district nursing services are often called upon to administer these eye drops, which are typically prescribed four times a day for four weeks, thus potentially totalling 112 visits for drop instillation per patient.

To reduce the burden of these post-operative eye drops on district nursing services, administration of an intra-operative sub-tenons depot steroid injection is possible for cataract patients who then do not require any post-operative drop instillation. As a trial of this practice, sixteen such patients were injected in one year, thus providing a reduction of 1792 in the number of visit requested. Taking an estimated cost of each district nurse visit of £38, this shift in practice potentially saved >£68,000; the additional cost of the injection over the cost of eye drops was just £8.80 for the year. This practice presents an opportunity to protect valuable community nursing resources, but advocacy for change in practice would be needed with secondary care, or via commissioners.

Key Words

Cataract, cataract surgery, ophthalmic solutions, community health nursing

Key Points

- Cataract surgery is the most common surgical intervention in the UK
- With the ageing population, a growing number of patients are unable to instill their own eye drops post operatively and require district nursing support
- A depot steroid injection intra-operatively removes the requirement for post-operative drops, thus permitting redeployment of valuable district nursing resources

Introduction

Cataract surgery is the most frequently performed surgical procedure in the world, with over 395,000 operations recorded in England alone in 2014/15 (HSCIC, 2015). Following cataract surgery, patients are typically required to use topical steroid drops four times a day for four weeks (112 drops) to suppress post-operative inflammation (Negi et al., 2006). The ageing demographic in the UK means that there are a growing number of people with diseases of older age, such as dementia or arthritis, that make it difficult for them to instil their own eye drops after cataract surgery. In such cases, friends or family members often provide the necessary support to ensure that the drops are given, however where that support is not available, requests for community nursing support are made.

The percentage of cataract surgery patients who are unable to instil their own eye drops post-operatively is small, and even when cataract surgery transitioned from being a predominantly in-patient procedure to the current situation where it is an almost entirely day-case procedure, little impact was noted in terms of community resources (Buckingham et al., 1997). However, with cataract surgical numbers in England projected to exceed half a million in the next 10 years, even small percentages are substantial in absolute numbers given the number of visits required per patient. This increasing demand comes to a sector already described as 'on their knees' (Quaile, 2016). Strategic approaches to management of the rising demand have been proposed,(Chalk and Legg, 2017) but ultimately, engagement of both the community sector and those from secondary care who depend upon community services to permit safe and efficient transition of care is essential for patients (Pellett, 2016).

We set out to determine whether the burden of eye drop application was significant for our community nursing services in Leeds, UK, and whether that burden could be alleviated by use of an

alternative modality of post-operative steroid delivery to obviate the need for any post-operative drops to be administered. We therefore report a prospectively evaluated case series; economic evaluation of the impact of such a practice is also considered.

Evaluation of the demand on community nursing services by eye drop instillation

Data from Leeds Community Healthcare NHS Trust coding of district nurse visits from September 2014 to July 2015 identified 18,892 visits to administer eye drops. Pro rata, this would extrapolate to an annual eye-drop related visit total of 20,500 for Leeds. It was not possible to differentiate between the indications for these eye drops, and although it would be expected that many visits would be for other indications, most notably glaucoma, it was felt that a reasonable proportion were post-cataract surgery hence a worthwhile reduction in demand on community nursing services was perceived to be possible by this initiative.

Alternative methods of delivering post-operative steroids

Literature search was undertaken to look for alternative methods of delivering post-operative steroids. Simple injection of sub-conjunctival steroid at the end of cataract surgery has been compared to the usual four weeks of post-operative steroid eye drops, and as might be expected it was not as effective in controlling objective markers of inflammation, but it was potentially adequate (Dieleman et al., 2011). Whilst this simple steroid injection is a potentially adequate alternative, concerns about the safety of this practice applied to a group who, by definition, have multi-morbidities and difficulty accessing support meant we rejected this alternative. Injections of drugs into the eye itself is now a common practice for age-related macular degeneration, and the use of intra-ocular injection of steroid (Karalezli et al., 2008) or placement of an intravitreal steroid implant (Gupta et al., 2013) are reported following cataract surgery (Gupta et al., 2013). The addition

of an invasive intervention of this nature which conveys an independent risk of complications, including infection, made these less attractive also.

We opted for a depot injection behind the eye (sub-Tenons) of a long-acting steroid, triamcinolone acetonide 30mg, as a randomised controlled trial of this agent reported that it gave slightly lower levels of inflammatory signs than the eye drops, and no complications were reported (Negi et al., 2006).

Some surgeons still prescribe antibiotic drops after routine cataract surgery despite the lack of evidence to support this practice (Raen et al., 2013). This is not routine in our hospital, so the change made was from steroid eye drops alone to the depot steroid injection. Intra-operative surgical complications sometimes mean that post-operative antibiotic drops are required, particularly where sutures are placed or there is a corneal abrasion. If such complications had arisen, it was decided that the depot steroid would not be given but that community nursing support would be sought in the usual way. This however did not occur in the study period so no patient was excluded on this basis.

Patient recruitment

Written consent for cataract surgery was obtained, and for those who felt they would neither be able to instil their own drops nor find support from family or friends, the option of the steroid injection was offered. The main potential side-effect from ocular steroid administration to the eye by any route, is of elevated intra-ocular pressure. The risk of pressure elevation from the injection may not be greater than that for the eye drops, however, if pressure does rise with the eye drops then the option to swap to a non-steroidal anti-inflammatory (which do not increase pressure) is available, hence patients with glaucoma were not considered appropriate for this depot steroid.

From May 2016 to April 2017, all patients seen with symptomatic cataract who wished surgery but who were deemed unable to self-administer eye drops underwent uncomplicated cataract extraction and were injected with 30mg triamcinolone. They were followed up routinely, and retrospective analysis of case notes was undertaken to identify any complications. This was not a comprehensive change of practice within the department, but a change introduced by one consultant. Pre-assessment nursing staff were asked to identify patients who required district nursing support post-operatively, and these patients were directed into the care of that consultant. By the end of the period reported, other consultants had also adopted this same practice.

Results

Sixteen patients underwent cataract surgery with the depot steroid injection who would otherwise have required district nurse support. No intra-operative or post-operative complication or elevated intra-ocular pressure was identified at case note review three months after the final patient had undergone surgery.

Economic evaluation

According to NHS England, in 2015, district nursing costs £38 per face-to-face contact (interquartile range £32 and £40) based on the mean full-time equivalent basic salary for Agenda for Change band 6 of the July 2014-June 2015 NHS staff earnings estimates for nurses, with an additional 12.7% incorporated to reflect payments for overtime (Curtis and Burns, 2015). Thus, a relatively modest intervention led by one consultant ophthalmologist changing practice, resulted in 16 less sets of 112 eye drops being requested. If all post-op drops were administered by the district nurse team as prescribed, that then would be 16x112=1,792 visits. If each visit was an independent event, this would then come at a cost of 1,792x£38 = £68,096. This would represent a maximal estimate, as it is

unlikely that every prescribed eye drop instillation was possible to be supported, and some of those visits may have been occurring for other indications in the same patients. It is also expected that in many community services, appropriately skilled and accredited non-registered staff might conduct the visits for eye drops. This would reduce the component of the visit cost that is attribute to staff salary.

However, with this being a change by one consultant in a department of 19 consultant ophthalmologists, there would likely be scope for expansion of this practice within that department and to other departments. A change in the way visit data is recorded within Leeds Community Healthcare NHS Trust during the recruitment period prevented us from comparing demand on community nursing services after inception of this practice, a significant disappointment and limitation of this study, but as all the patients recruited would certainly have had a request for post-operative support (the joint decision between patient and pre-assessment nurse to request district nursing support being the prerequisite for inclusion), the absolute savings can be robustly asserted.

It is of note that none of the direct economic benefit or opportunity cost savings are conveyed to the secondary care institution whose practice must alter to realise this saving. The cost to secondary care is minimal however, as each injection is only £0.55 more expensive than the bottle of eye drops routinely given, and giving the injection adds very little additional surgical time, which might be estimated at one additional minute per case (BNF, 2015).

Discussion

The demographic of the UK is ageing, with the population over 85 years of age set to more than double from 2010 to 2035, and the ratio of those of working age compared to those of retirement age dropping (ratio in 2010 of 3.16, dropping to 2.87 by mid-2035) (Rutherford, 2012).

It seems likely that the need for community nursing services will grow faster than the capacity of those services to meet that need unless attention is paid to both sides of the capacity / demand equation, and services are targeted to those individuals for whom it is most critical. Evidenced based approaches focussed on patient-centred outcomes are needed, but the right direction may not always be intuitive, such as a recent meta-analysis questioning the benefits of detailed discharge planning on patient health outcomes (Mabire et al., 2017). Evaluation of interventions is essential, therefore, to demonstrate safety and encourage wider adoption of practices found to be effective.

As the number of cataract surgeries performed in the UK is predicted to rise by 50% in the next 20 years,(Buchan et al., 2017a) the opportunity to save community nursing resources by this practice is also likely to grow. Should the demand for community nursing support outstrip the capacity of that service, then patients may be left receiving inadequate levels of post-operative medication - an involuntary non-compliance adding to the existing matrix of factors promoting non-compliance (Dury, 2013) which could result in patients with excessive inflammation presenting to emergency services, who in turn may have limited capacity to absorb this additional requirement.(Buchan et al., 2017b)

Interventions that promote efficient use of resources such as this are not primarily about saving money, but about releasing the finite capacity of health care services to engage with the care activities that offer the best value. Cost-cutting can be counter-productive in some instances,(Jones, 2015) however in a setting where sufficient visits to administer the full course of eye drops cannot be supported, this depot steroid injection option could offer superior post-operative inflammation control at a lower price. With rising costs and limited resources, this has to be attractive to all.(While, 2015) The relevance of this practice extends beyond the reduced burden on the community nursing services. Many families or other informal carers make significant efforts to support patients in the post-operative period following cataract surgery, taking leave from work or

travelling long distances to offer care. Therapeutic options that reduce the extent and duration of support needed would also be welcome, and it might be expected that reducing the burden on informal care, does at some point reduce the burden on formal care mechanisms as some informal carers if it allows carers to cope for longer without recourse to professional support.

Encouragement of adoption of such interventions requires a collaborative thinking across the health sector, with little or no benefit to those whose practice must change. It may, therefore, be that commissioners have a role to play in ensuring that the providers who serve them, both in secondary care and in the community, are encouraged to minimise demands on the wider health economy.

The contribution of the academic community is also required. National commissioning guidance requires evidence base, and a controlled study of this intervention specifically constructed to look at cost-benefit would be a valuable advocacy tool to encourage wider uptake. Other advances in ophthalmic treatments that could reduce dependency on eye drops such as MGDRx EyeBags (The Eyebag Company, Halifax, UK) for dry eyes(Bilkhu et al., 2014, Redmond and While, 2008) or selective laser trabeculoplasty for open angle glaucoma(Gazzard et al., 2017) could equally undergo evaluation in the sub-population requiring district nursing support for eye drops instillation. This would not be in the cause of cost reduction, but in recognition that protecting the district nursing resource equates to protecting the patients they serve.

Conflict of interest

The authors have no conflict of interest in this work.

Ethical approval

As the clinical methods in this study are established methods of performing cataract surgery and administering steroids for ophthalmic indications and are in routine use in other NHS trusts, there was no element of experimentation and formal ethical approval was not deemed necessary by the

University of Leeds Ethical Screening to which the authors submitted an application for ethical approval.

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