

Why do General Practitioners prescribe antibiotics for acute infective conjunctivitis in children? Qualitative interviews with GPs and a questionnaire survey of parents and teachers

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Background. Acute infective conjunctivitis in children is a common presentation in primary care. Treatment is usually with antibiotics and prescribing may be affected by non-clinical factors.

Aims. To investigate the non-clinical determinants of the management of acute infective conjunctivitis in children.

Design. Qualitative interviews with GPs and a questionnaire survey of parents of children with acute infective conjunctivitis and teachers.

Setting. GPs in Sheffield and Berkshire and parents of children with acute infective conjunctivitis and schools in Oxfordshire.

Methods. Semi-structured telephone interviews of 39 GPs. Questionnaire survey of 326 parents of children enrolled into a trial of acute infective conjunctivitis treatment. Questionnaire survey of 223 nurseries and primary schools in Oxfordshire.

Results. All three groups agreed that acute infective conjunctivitis was a mild condition. Parents were certain about the benefits of antibiotic treatment and sought early consultations with their GP in a desire to get their child back to school. GPs sometimes collude with a parent's request to prescribe to enable school attendance. Despite this 54.2% (95%CI 48.5–59.8%) children missed a mean of 1.85 days from school and 28.6% of parents (95%CI 23.5–33.7%) missed a mean of 1.5 days off work.

Conclusion. Social factors, including the need for children to attend day care or school and parents to go to work, contribute to the decision to prescribe antibiotics for children with acute infective conjunctivitis. Understanding these issues and changing school policies in line with national guidance may reduce pressure on GPs to prescribe for this condition.

Keywords. Antibiotic, child, conjunctivitis, prescribing, social.

Introduction

Acute infective conjunctivitis is a common problem in primary care, accounting for up to 1% of all consultations.^{1,2} GPs are confident about making the diagnosis but most recognise the difficulty of differentiating viral from bacterial causes and routinely prescribe topical antibiotics.³ There are 3 million community prescriptions for topical ocular antibiotics

issued each year in English general practice⁴ and about 1 in 5 children under 4 years are brought to the doctor with conjunctivitis each year.⁵ Prescribing antibiotics for acute infective conjunctivitis has some clinical justification as, unlike other common infections in primary care, acute infective conjunctivitis is commonly caused by bacteria. However, the six published treatment trials of topical antibiotic therapy done in specialist care patient populations with proven bacterial

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infection show a high rate of spontaneous resolution⁶ and these results have recently been confirmed in a primary care population of unselected cases.⁷

We are aware that the effectiveness of the drug is not the only consideration in prescribing decisions. Any benefit from antibiotics needs to be set against the cost of the consultation and the selective pressure created for antibiotic resistance. We are also aware that parents, schools and doctors have differing perspectives and agendas for the management of this condition. Factors that influence the decision include beliefs about the condition and the need for treatment, patients' own time and economic considerations, and public health policy.

There is only one published study addressing non-clinical determinants of prescribing in conjunctivitis. Everitt published a qualitative study of patients' understanding of conjunctivitis that included 11 parents of children with conjunctivitis which showed that the condition raised parental concerns about the infectivity and need for treatment of the condition. However, when informed that the rate of cure was high without antibiotics, parents were prepared to forego a prescription, even if this meant the child having time off school.⁸ This still leaves a substantial evidence gap which we have tried to fill with the three linked studies reported here: a questionnaire survey of parents of children with conjunctivitis, qualitative interviews with GPs exploring how they manage acute infective conjunctivitis in children and a questionnaire survey to ascertain the policies of schools and day care facilities.

Methods

Parental survey

A questionnaire was developed by members of the OXCIS group addressing issues raised by the literature and our clinical experience. This questionnaire was used in a survey of parents and was undertaken as part of our treatment trial of children presenting to their GP with acute infective conjunctivitis in 12 Oxfordshire practices.⁷ The questionnaire was given to the parent accompanying the child at recruitment, and was collected by a research nurse during a follow-up visit 7 days later. The questionnaire included seven statements on treatment, transmission and social disruption, and parents stated whether they strongly agreed, agreed or disagreed with each statement (Box 1). It also elicited information about parents' behaviour before seeking medical advice, their decision to consult, and the social and economic impact of the illness on the family. Methods and recruitment for the trial are reported in detail elsewhere.⁷ Of all the eligible children 29% were recruited into the trial and, of the 326 children who took part, questionnaires were returned by parents of 312 (95.7%). However, the completion of specific questions varied so the denominators

Box 1 *Questionnaire to parents*

Parent was asked to 'strongly agree', 'agree' or 'disagree' with each statement

- Conjunctivitis would not get better without treatment
- Conjunctivitis might get better quicker with treatment
- My child would not be able to attend school/nursery/childminder unless seen by a doctor
- Conjunctivitis might spread to other household members
- Conjunctivitis might spread to other children at school/nursery
- I might need to take time off work to look after my child
- Conjunctivitis needs immediate treatment

TABLE 1 *Demographic details of trial participants*

	Number (%)
Mother's age	Total 322
19–24 years	23 (7)
25–29 years	40 (12)
30–34 years	120 (37)
35–39 years	81 (25)
40 years or over	58 (18)
Mother's educational level	Total 320
School to age 16	101 (31)
School over age 16	34 (10)
College	83 (26)
University	65 (20)
Postgraduate	32 (10)
Other	5 (2)
Child's ethnic origin	Total 325
White	310 (95)

reported in the results section also vary: the factual fields (e.g. time off work) tend to be completed more fully than the attitudinal questions. The demographic features of trial participants are shown in Table 1.

Qualitative interviews with GPs

GPs were identified from lists of principals provided by the four Primary Care Trusts in Sheffield and the six Primary Care Trusts in Berkshire. These areas were chosen to offer demographic diversity while avoiding contamination from the trial of antibiotic prescribing in Oxfordshire practices that ran concurrently. GPs were selected from the lists using random number tables and invited by letter, sent in batches. Those consenting to participate were interviewed by telephone by one of the authors (PWR). A social scientist gave feedback on initial interviews and advised on strategies to minimise interviewer effect, including acknowledging to the interviewee that the interview might feel like a test (but was not) and the use of neutral responses rather than 'right'. Interviews were tape recorded and transcribed for analysis, which began during data collection.

TABLE 2 Characteristics of GP interviewees

	Number	%
Male	21	54
Within 15 years of qualification	11	28
MRCGP	30	77
Full time	19	49
Work in a training practice	15	38
Practice in inner city/urban setting	32	82
>30% ethnic minority groups in practice population	5	13
Significant social deprivation in practice population	5	13

Box 2 Content of GP interview

- Clinical scenario (see text)—How would you conduct such a consultation right from the beginning?
- Are there any circumstances where you would do or say anything different?
- Would there be any circumstances when your decision to prescribe or not prescribe antibiotics would be different?
- How would you respond if the mother said the she was due at work the next day and the child would only be admitted to nursery school if he was on antibiotics?
- Do you ever try to differentiate viral from bacterial causes of conjunctivitis. How do you do this?
- Would you discuss infectivity/risk of transmission/exclusion from school/hygiene issues? Are the issues the same or different in children at school compared with nursery?
- Do you have a personal view about the need for exclusion from nursery or school?
- Do you think that you have acquired any particular experience that might influence your management compared with other GPs?
- Do you have any unanswered questions about the management of conjunctivitis in children?

Recruitment continued until no new perspectives were identified (data saturation). The response rate was 19% and characteristics of respondents are shown in Table 2.

A semi-structured schedule was developed and piloted (Box 2). Minor amendments were made after the initial interviews to allow exploration of additional issues raised by the GPs. The interview included a clinical scenario: “A mother brings her 3-year-old son into evening surgery in an urgent appointment slot. She picked him up from his nursery school that day and the teacher said that his eyes had become red and sticky during the day and the mother was advised to consult her GP. The child’s eyes were red but no pus was visible”.

Qualitative thematic analysis was performed using constant comparison independently by two researchers

(PWR and SZ). Anticipated and emergent themes were revised through discussion and developed to take account of all the data.⁹

Survey of nursery schools

A list of schools and facilities was supplied by the Oxfordshire Childrens’ Information Service. All nursery schools, primary schools and day care facilities in five urban and rural areas in Oxfordshire were sent a postal questionnaire. The questionnaire asked about the type of institution and the school’s policy on managing children with conjunctivitis including advice given to parents and rules on exclusion. A reminder was sent after 6 weeks if no reply had been received. Questionnaires were received from 165 of 223 (74.0%) schools contacted. There were 46 pre-school, 45 primary schools, 63 nursery schools and 25 other types of institutions (some institutions combined more than one facility).

Analysis of survey data

Data from the two questionnaires were double-entered into Microsoft Access and analysed using SPSS version 12. Confidence intervals are calculated on the basis of the standard error of a proportion.

Results

Survey of parents of children with conjunctivitis

Parental expectations and experience of illness. Most parents reported that they knew their child had conjunctivitis before consulting a doctor (236/300, 78.6%, 95% CIs 74.7–83.9%) and their knowledge of the name of the condition did not influence their attitudes (Table 3). The majority of parents (93%) felt that treatment would help their child get better more quickly and most felt this treatment should be sought immediately, but fewer parents (60.8%) felt that the child would not get better unless treated. Many parents said that they had tried to treat their child before visiting their GP by bathing their eyes (169/195, 57.3%) or buying eye drops or ointments from a pharmacy (21/191, 6.7%). The median duration of the three cardinal symptoms before presentation to the GP was 24 hours for redness and soreness (inter-quartile range 18–48 hours for redness and 12–48 hours for soreness) and 29.5 hours for discharge (inter-quartile range 13–50 hours). Most parents (234/295, 79.3%) requested an immediate or same day appointment when they decided to contact their GP.

Of the parents 82% had been concerned about the infectivity of conjunctivitis within the household and 86% within school or playgroup, and 78% expressed concern about children missing school. Of the 299 children for whom we have the information (from the main trial data), 162 (54.2%, 95% CI

TABLE 3 Parents views on treatment, transmission and social disruption of their child's illness: proportion rating each statement as 'agreed' or 'strongly agreed'

	All parents (N = 312)			Parents knew condition was conjunctivitis (N = 236)		
	n	%	95% CI (%)	n	%	95% CI (%)
Treatment						
Will not get better without treatment	176/289	60.8	55.3–66.5	107/194	55.2	48.2–62.2
Will get better quicker with treatment	278/299	93.0	89.5–95.6	183/197	92.9	88.4–96.1
Needs immediate treatment ^a	222/293	75.8	70.9–80.7	145/197	73.6	67.4–79.8
Transmission						
May spread to others at home	244/299	81.6	77.2–86.0	167/200	83.5	78.4–88.6
May spread to others at school/nursery	235/273	86.1	82.0–90.2	158/178	88.8	84.1–93.4
Social disruption						
Will prevent school/nursery attendance	211/269	78.4	73.5–83.4	145/180	80.6	74.8–86.3
Will require time off work	154/245	62.9	56.8–68.9	102/163	62.6	55.1–70.0

^a79% of parents sought an immediate or same day appointment with GP.

48.5–59.8%) children missed a mean of 1.85 days from school and 86/301 of parents (28.6%, 95%CI 23.5–33.7%) had to take time off work, missing a mean of 1.5 days, although 63% had reported that they might need to miss work.

Parents' sources of advice. Two-thirds of parents did not report seeking advice from others before contacting the GP. Those that had (107/306, 35.0%, 95% CI 29.6–40.3%) reported the main sources of advice as friend or relative (41, 38.3%), teacher or childminder (21, 19.6%), and health professionals (pharmacist, nurse or health visitor (26, 24.3%). Only 4 (3.7% of those seeking advice, 1.3% of all parents) had contacted NHS Direct. Common advice from these sources was that the condition was infective, that treatment should be sought immediately and most teachers said that the child should stay away from school until treated.

Qualitative study with GPs

Consultations for conjunctivitis were familiar—30 of the 39 GPs estimated they saw at least one case per fortnight—and the consultation was usually described as “quick and easy” and used as a “catch up consultation”. One GP described it as a “transaction” easily fitted into his 3-minute urgent surgery. All GPs described being confident about the diagnosis of acute infective conjunctivitis, which was seen as a mild and self-limiting infection. Most thought the aetiology was usually viral, often a symptom of a generalised upper respiratory infection. We report below the GPs views of parents' concerns, their own views of transmission risks and their decisions to prescribe in response to the clinical scenario.

GPs views of parents' concerns. GPs sometimes suspected that parents were worried about eye infections as a potential cause of blindness in their children (“they panic they are about to become blind”). Several GPs were also aware of concerns about the appearance of conjunctivitis: “they are apologetic about the appearance of their children ... all this mess around, it must be spreading disease”. A male GP from Berkshire commented:

So there is often quite a lot of emotional thing about you know spreading it to other people and worrying about it. People do worry about conjunctivitis. I think they often think it can damage the eyes or that it's very infectious .. spreads around. So you, the parents often feel a bit like a social leper for 2 or 3 days. So umm, I'd, you'd treat it quite seriously though as a, I don't regard it as, I think it is a self limiting condition really. B010 Male GP Berkshire

Transmission risk. The GPs we interviewed had very differing views about the transmission risk. Some described it as “very contagious” or “contagious” while others felt it was not easily transmitted: “no more infectious than a cold, small and overestimated”. Some admitted they did not know exactly how infectious the condition is or how long it remained infectious, but viral causes were thought to be more infectious than bacterial and to come in clusters.

Decision to prescribe. All but one of the GPs interviewed said they were very familiar with the situation described in the clinical scenario on which they were asked to comment (“you paint the scenario well ... mums comes in fraught really, having been told they have to do this”). A recurring theme was the social

aspects of the condition: many volunteered the observation that the **need for antibiotics to enable nursery attendance was often paramount in the consultation with the pressure to prescribe being related to external factors such as the policy of the local nursery or the individual childcare arrangements.**

Some of the GPs, like this man from a middle class area of Sheffield, were quite pragmatic about the need to prescribe to enable school attendance:

... if I was going to prescribe antibiotics any way it wouldn't be a problem but if I wasn't going to prescribe antibiotics I would rethink again and I would have a chat with [the] parent further, negotiate and you'd probably end up prescribing antibiotics. I think a prescription costing three or four quid is far less stressful than an anxious angry mother. S050 Male GP Sheffield

Another suggested that prescribing according to social factors might not be best practice, but also clearly believed she was 'not alone':

We know all of the nurseries and I look after one of the nurseries in the area anyway and the school attached, so I know their policies. Some are more flexible than others... and then really, based on how red the eyes were and how anxious, whether the mum was working, whether she needed to get back to work, I would then negotiate with her the possibility of using some formal treatment rather than just... bathing the eye. And I hate to say it but I am sure I am not alone, my clinical decision would be based quite strongly on those social factors. B015 female GP Berkshire

However, some GPs said they would not change their decision to prescribe for this reason alone. Other

reasons that this was not an issue for some GPs included the fact that nursery pressure about exclusion was uncommon in their practice, or that nursery attendance was uncommon among their primarily lower social class and ethnic minority population. Exclusion was thought to be more of an issue in nursery compared with other schools because the risk of transmission was perceived as greater in younger children.

Views about the need for exclusion were sometimes related to what the GP did for their own children; for example, a female GP from Sheffield commented on her fairly robust attitude to her children's schooling:

I wouldn't encourage her to keep him off nursery but that's my own experiences showing forth I think.

Interviewer: Okay, when you say your own experience, do you mean with your own children?

Well we had the rule if you could stand up you went. S083 Female GP Sheffield

Policies of educational facilities

The policies of the schools and pre-school facilities are summarised in Table 4 and reflect their perception that conjunctivitis is moderately (30/160, 18.8%) or highly (121/160, 75.7%) contagious. Most (138/162, 85%) recommended to parents that their child should be seen by a GP immediately and would not admit the child until they had been seen. The length and conditions of exclusion varied from re-admission immediately to exclusion until 5 days after commencing treatment or cured, and less than half of schools (75/155, 48%) were prepared to administer treatment.

Convergence and divergence of views

There was clear agreement between the views of GPs, advisors and parents about the lack of seriousness of

TABLE 4 Educational institutions, declared policies on conjunctivitis

	Pre-school institutions		Nursery		Primary		All		95% CI
	n	%	n	%	n	%	n	%	
Advised parent to see GP same day	39/45	86.7	55/62	88.7	39/43	90.7	138/162	85.2	79.7–90.7
Policy to exclude untreated child	43/45	95.6	53/62	85.5	37/44	84.1	139/163	85.3	79.8–90.7
Can return to school when									
Seen by GP	10/42	23.8	19/54	35.2	17/37	45.9	47/140	33.6	25.7–41.4
Treated ^a	10/42	23.8	25/54	46.3	10/37	27.0	46/140	32.9	25.1–40.6
Cured	22/42	52.4	9/54	16.7	17/37	45.9	46/140	32.9	25.1–40.6
Willingness to administer eye drops									
Staff will do it	12/41	29.3	44/62	71.0	13/42	31.0	75/155	48.4	40.5–56.3
Parent must visit	12/41	29.3	12/62	19.4	22/42	52.4	48/155	31.0	23.7–38.2
Can't attend	17/41	41.5	6/62	9.7	7/42	16.7	32/155	20.6	14.3–27.0

^a Some specified immediately, some after so many days (1 day = 10, 2–3 days = 4, 5 days = 1).

conjunctivitis, despite some GP reports that some parents may worry about blindness. Three-quarters of teachers or childminders advised that time off school is necessary, raising parents concerns about the impact of the disease on their lives. In consequence consultations were requested early in the illness and urgently. Parents appeared convinced that antibiotic treatment would speed recovery. However, a significant driver for prescribing seemed to be the widespread perception among parents and teachers that treatment is effective (and mandatory) to stop transmission. GPs were uncertain about whether or not this is true, but most were happy to comply with the demand for treatment, seeing it as a quick and easy consultation outcome.

Many GPs said that they prescribed to all cases because of lack of evidence to the contrary. These GPs therefore did not have a problem with parents who requested antibiotics to allow school attendance. For other GPs, the decision to prescribe antibiotics for acute infective conjunctivitis was influenced by a number of factors and tailored to the circumstances in each consultation. Many GPs acknowledged that social and public health issues were significant factors in their ultimate decision.

Discussion

This is the first study in primary care that has investigated acute infective conjunctivitis in children from the viewpoint of the three main players in its management—GPs, parents and schools. The results show agreement about **the importance of social factors in the actions of parents and GPs**. The research confirmed the differences in priorities for each group—**the parents desire to seek early treatment in response to their own beliefs and advice from others, coupled with desire to get children back to school as soon as possible**. In contrast, many school and nursery policies excluded children with acute infective conjunctivitis in response to public health advice. Some divergence of views may have resulted from the different geographical locations of the GPs compared with the parents who were surveyed. Lay beliefs about the risk of transmission and the benefit of antibiotics encouraged parents to consult quickly when their child has acute infective conjunctivitis. GPs uncertainty about the aetiology and lack of evidence to guide management meant that they were often happy to collude with parents in prescribing antibiotics to enable school attendance. This action may have reinforced parents' belief that they were right to seek an urgent appointment. Despite this, there was a significant burden of missed school and work caused by this disease, although less parents missed work than anticipated.

This research has some limitations. All the parents contributing had consulted a GP and volunteered to take part in a research study; although their response rate was exemplary (96%), many individual items were incomplete (so the effective response rate to some questions was as low as 75%). The demography of the participants reflects the more affluent population in participating practices and, as one of the GPs in the study suggested, attendance at work and school may be less of a problem for others. We did not have access to the perspectives of parents who chose not to consult for this condition. Only 1 in 5 GPs approached agreed to be interviewed, possibly because the invitation was by post; telephone contact was not allowed until a consent form was returned. However, data saturation was reached from the sample of GPs who did respond. Although the GPs came from only two, albeit very socially diverse, parts of the UK (Sheffield and Berkshire) there was considerable variation in responses. The GPs knew that they were talking to a fellow GP from an academic department and this may have affected their answers. In common with other interview studies, we are not able to confirm that the GPs' actual clinical activity truly mirrors their accounts of this behaviour. However, the themes reported were plausible and consistent among the GPs interviewed. Some GPs wanted to discuss whether their current clinical practice was correct. This discussion was always delayed until after the conclusion of the research interview. The school survey was limited to Oxfordshire and reflects the local policy to exclude children with acute infective conjunctivitis until better (K. Knox, Personal communication). Other areas of the country may have different policies—the widespread policy to exclude is certainly at variance with national guidance¹⁰ and this may be one reason why our results seem to contradict those of Everitt.⁷ This research suggests that **prescribing for conjunctivitis in children is driven by factors other than GP belief in clinical effectiveness**. These findings are likely to have widespread relevance as acute infective conjunctivitis and its social implications are a common problem across the developed world. Further research, which could also address the limitations of this study, will be necessary to confirm that these findings are true for these other areas. However, the situation is different in some developing countries where other causes of conjunctivitis require treatment to prevent blindness.

Lay beliefs about transmission and need for treatment and the exclusion policies operated by nurseries and schools, create a demand for treatment of acute infective conjunctivitis, despite its high spontaneous cure rate. This research suggests that GPs should acknowledge and explore these issues when consulting with a child with conjunctivitis. However, reduction of the pressure on GPs to prescribe will not only require

GP education but also education of the public and schools to implement current public health policy on exclusion.

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References

- ¹ McDonnell PJ. How do general practitioners manage eye disease in the community? *Br Ophthalmol* 1988; **72**: 733–736.
- ² Dart JK. Eye disease at a community health centre. *Br Med J (Clin Res Ed)* 1986; **293**: 1477–1480.
- ³ Everitt H, Little P. How do GPs diagnose and manage acute infective conjunctivitis? A GP survey. *Fam Pract* 2002; **19**: 658–660.
- ⁴ Prescription cost analysis: England 2003. Department of Health. Available at www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsStatistics (accessed 18 November 2004).
- ⁵ McCormick M, Fleming D, Charlton J. Morbidity statistics from general practice: Fourth national survey 1991–1992. London: HMSO; 1995.
- ⁶ Sheikh A, Hurwitz B. Topical antibiotics for acute bacterial conjunctivitis: a systematic review. *Br J Gen Pract* 2001; **51**: 473–477.
- ⁷ Rose PW, Harnden A, Brueggemann A B, Perera R, Sheikh A, Crook D, Mant D. Chloramphenicol treatment for acute infective conjunctivitis in children in primary care: a randomised double-blind placebo-controlled trial. *Lancet* 2005; **366**: 37–43.
- ⁸ Everitt H, Kumar S, Little P. A qualitative study of patients' perceptions of acute infective conjunctivitis. *Br J Gen Pract* 2003; **53**: 36–41.
- ⁹ Pope C, Ziebland S, Mays N. Qualitative research in health care: analysing qualitative data. *Br Med J* 2000; **320**: 114–116.
- ¹⁰ Health Protection Agency. Guidelines on the management of communicable diseases in schools and nurseries: Conjunctivitis. Available at www.hpa.org.uk/infections/topics_az/schools/guideline_info/conjunctivitis.htm (accessed 18 November 2004).