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A national survey to assess the prevalence of written guidance for occlusion and practice variation in the treatment of amblyopia

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Abstract

Aim: **To assess the prevalence of written clinical guidance for occlusion treatment and variation in occlusion practice within orthoptic departments in the United Kingdom (UK).**

Method: **A questionnaire was sent to every orthoptic department in the UK. Questions asked about the existence of written guidance in departments and how this guidance had been developed. Subsequent questions asked about the treatment of amblyopia. Clinical scenarios of amblyopia were provided and departments had to indicate the occlusion in hours that would be prescribed.**

Results: **One hundred and ninety of 240 questionnaires were returned, a response rate of 72%. One hundred and eighty-six questionnaires were suitable for analysis. Sixty-six of 186 (35%) responding departments had written guidance for occlusion, 70 (38%) had some general department consensus on occlusion, 47 (25%) had no departmental consensus on occlusion and 3 (2%) declined to answer. Statistical analysis indicated there were significant differences between departments 'with guidance' and those 'without guidance' in the amount of occlusion prescribed if treating more severe amblyopia (6/60 vision). There were no significant differences in occlusion prescribed for less severe amblyopia (6/12 vision).**

Conclusion: **In the responding departments the prevalence of written guidance for occlusion treatment was low and there were significant variations in the amount of occlusion that would be prescribed. It is essential to have good-quality, robust evidence on which to base clinical decisions.**

Key words: Amblyopia, Evidence-based, Guidelines, Practice variations

Introduction

The most common form of treatment for unilateral amblyopia is occlusion,[1] of which the conventional patch is the most common method. The patching regime prescribed varies for individual patients, with the orthoptist treating the child making a judgement on the amount of occlusion needed. This is often based on various factors, including the density of the amblyopia, the age of the child, age at onset, ocular pathology, social and health considerations in addition to the orthoptist's own clinical experience.

Over the last 20 years, the importance of evidence-based practice has been increasingly emphasised, worldwide, in all avenues of medicine. Clinical (or practice) guidelines became common in all fields of medicine during the 1990s.[2] These guidelines are recommendations for the care of individuals by healthcare professionals and are based on the best available evidence.[3] They have been called a 'logical response to unwanted variation in clinical care'.[2]

Developers of guidelines for clinical practice attempt to identify, appraise and collate the best evidence to ensure the highest-quality information is available for both clinicians and patients.[4] One difficulty in applying this approach to the area of occlusion for amblyopia is that the current evidence on various factors thought to influence the effectiveness of treatment is varied. For each of these factors, which include age of patient, density of amblyopia, type of amblyopia and compliance, there are numerous studies published. Studies differ in their methodology and quality, and range from retrospective studies[5–7] to large prospective cohort studies[8–10] and more recently randomised controlled trials (RCTs).[11–13] The findings reported frequently vary because of differences in the research methods used, the selection of outcome measures, the inclusion and exclusion criteria and differing definitions of 'success' of treatment. Consequently it can be difficult for clinicians to draw useful conclusions from these reports.

The Royal College of Ophthalmologists (RCO) has published guidelines for the management of strabismus and amblyopia.[14] These are 'intended to be general principles rather than specific protocols, regarding best management'. One of the aims of their guidelines is to enable the development of 'locally based protocols' for management and treatment of such cases.

The aim of this study was to assess the prevalence of written guidance for occlusion treatment and variation in occlusion practice within orthoptic departments in the United Kingdom (UK).

Method

In February 2004 a questionnaire (Fig. 1) was sent to every UK orthoptic department, accompanied by a

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covering letter and a stamped addressed return envelope. Reminder letters and repeat questionnaires were sent to non-responders. The initial questions asked about the use of any form of written guidance for occlusion treatment, the name given to any guidance, which professionals had been involved in the development of the guidance and the sources of information used.

Tan *et al.*[15] used clinical scenarios to evaluate guidance and practice variations in amblyopia in European countries. This approach was adopted in the second part of the questionnaire, which asked departments to document the minimum and maximum occlusion time in hours that would be prescribed for the clinical scenarios given. Answers had to be based on the department's written guidance if present, or departmental consensus/personal preference if no guidance existed.

Four clinical scenarios of amblyopia were given (see Fig. 1, scenarios a, b, c and d). In each scenario the patient's age and degree of amblyopia varied. The questionnaire stated that all scenarios were for new patients (i.e. no previous treatment) who had had a refraction, fundus and media check, had no ocular pathology, no squint and had been wearing any refractive correction required for at least 2 months.

Results

Prevalence of guidelines

There was a response rate of 72%, with 190 of 240 questionnaires being returned. Four hospitals stated that they did not see or treat children in their department and were therefore excluded from further analysis. This left 186 forms to be analysed.

Of the 186 departments, 66 (35%) had some form of written guidance for occlusion. Of these 66 'with guidelines' departments, 35 called it a protocol, 25 a guidance, 1 a policy and 5 had other names, which included 'standard'.

Of the remaining 120 departments without written guidelines, 70 (38%) had some general department consensus on occlusion, although this was not written or documented. Forty-seven (25%) did not have any departmental consensus on occlusion and 3 (2%) declined to answer. The details of the professionals involved in the development of the guidelines and the sources of information used have been reported elsewhere.[16]

Variation in occlusion practice

Analysis considered the responses to the clinical scenarios. Departments with department consensus and departments with neither written guidance nor department consensus were grouped together to form a 'without guidance' group. This allowed comparison of occlusion hours prescribed by the 'with guidance' and 'without guidance' departments.

Consideration of the frequency distribution of the minimum and maximum amounts of occlusion hours for each scenario showed that the data were not normally distributed for the 'with guidance' or 'without guidance' departments. The data in hours of occlusion are therefore presented as medians and interquartile ranges (Fig. 2).

It is evident that there was a wide variation in the number of hours prescribed as minimum and maximum amounts of occlusion within a scenario for both department groups. There were more outliers for the departments without guidance. Consideration of the median amount of occlusion within a clinical scenario shows that the median minimum value was lower than the median maximum value. This was a consistent pattern across the four scenarios, for the two departmental groups.

Non-parametric analysis was used to determine whether there were any significant differences between the amounts of occlusion prescribed by the two department groups. Results of the Mann-Whitney test are shown in Table 1. There were significant differences for both minimum and maximum occlusion in scenarios (a) and (b).

Discussion

When this study was conducted in February 2004, approximately a third of the orthoptic departments in the UK who responded to the questionnaire had some form of written guidance for occlusion treatment. A further third of responders had some verbal departmental consensus on occlusion. The remaining third of responders did not have any form of guidance in place and the individual orthoptist determined treatment. The response rate to this study was 72%. It is possible that the 28% of UK departments who did not respond differ from those that did respond and might alter the prevalence calculated.

To evaluate the variation in the amount of occlusion prescribed, the questionnaire provided clinical scenarios of amblyopia. It is acknowledged that the examples given in the questionnaire were simplistic and do not reflect the social and psychological factors that may be considered when deciding upon treatment of such cases. Analysis showed there was a wide variation in the number of hours prescribed as minimum and maximum occlusion by the 'with guidance' and 'without guidance' departments.

Whilst some variation in all aspects of clinical practice is virtually inevitable, what is considered an acceptable range is unclear.[2] Widely differing treatment regimes regarding occlusion have been promoted in the literature.[19] Tan *et al.*[15] published results of a questionnaire comparing differences in the management of amblyopia between European countries and concluded that there was a lack of uniformity in the approach towards amblyopia treatment throughout Europe. It is likely that the variation in the data presented in this paper is a reflection of the different evidence on which written guidance or clinical practice is based. It highlights the lack of uniformity and standardisation in occlusion treatment for amblyopia throughout the UK.

Statistical analysis indicated there were significant differences in the occlusion hours prescribed by the two

1. Please tick which best describes your hospital/workplace:
   - Teaching ☐
   - District General ☐
   - Community ☐
   - Other (please state) ☐

2. Please indicate if you regularly have the following type of students within your department:
   - Orthoptic ☐
   - Medical ☐
   - Neither ☐

3. Does your department currently have some form of written guidance for occlusion treatment?
   - Yes ☐
   - No ☐

   If **Yes**, is this called a:
   - (i) Protocol ☐
   - (ii) Clinical policy ☐
   - (iii) Guideline ☐
   - (iv) Other (please state) ☐ Please go to question 4

   If **No**, does your department have a general consensus/agreement on occlusion that is currently not documented?
   - Yes ☐
   - No ☐ Please go to question 6

4. When was this developed or last updated? ☐☐/☐☐☐☐ Not documented ☐
   mm/ y y y y

5. Please indicate how the guidance was developed and decided upon (tick more than one if appropriate).

   people involved:
   - Consultant ophthalmologist(s) ☐
   - Head orthoptist ☐
   - Senior I orthoptists ☐
   - Senior II orthoptists ☐
   - Other (please state) ☐

   information sources: Please indicate if any of the following sources:
   (a) were found to be useful in developing the guidance (used) or
   (b) you would like to have been available but were unable to find sufficient information on (ideally):

   (Tick as many as applicable)

	Used	Ideally
Clinical experience	☐	☐
Other departments protocols	☐	☐
Literature:		
Published research articles	☐	☐
Editorials	☐	☐
Meetings/talks	☐	☐
National occlusion guidance	☐	☐
Other (please state)	☐	☐

6. Please answer the following clinical examples, using the method stated in question 3, i.e. (i) written occlusion guidance if one exists or otherwise (ii) department consensus if possible or (iii) own individual experience. (If the guidance within the department is very broad for treatment options please reflect that, even though your own preference may be more specific.)

   It is very much appreciated that these are hypothetical situations, and that occlusion has to be tailored to suit each individual child's needs. All of these examples are of new cases (i.e. no previous treatment) and all have had a refraction, fundus and media check, have no squint or ocular pathology and have been wearing any correction needed for at least 2 months.

   Please indicate how much occlusion (conventional patching total to light and form) you would prescribe and when you would arrange to review for the following four examples:

   (a) 2-year-old child, vision R 6/60 L 6/6

   Occlusion time (hours)

   Min

   Max

   Review (weeks)

   (b) 3-year-old child, vision R 6/18 L 6/6

   Occlusion time (hours)

   Min

   Max

   Review (weeks)

   (c) 4-year-old child, vision R 6/12 L 6/6

   Occlusion time (hours)

   Min

   Max

   Review (weeks)

   (d) 5-year-old child, vision R 6/60 L 6/6

   Occlusion time (hours)

   Min

   Max

   Review (weeks)

   I would be most grateful for details of any information sources used in development of any guidance used (e.g. paper's author, title, etc.) and for any further comments that you wish to make on this questionnaire.

Fig. 1. Questionnaire distributed to all orthoptic departments in the United Kingdom in February 2004.

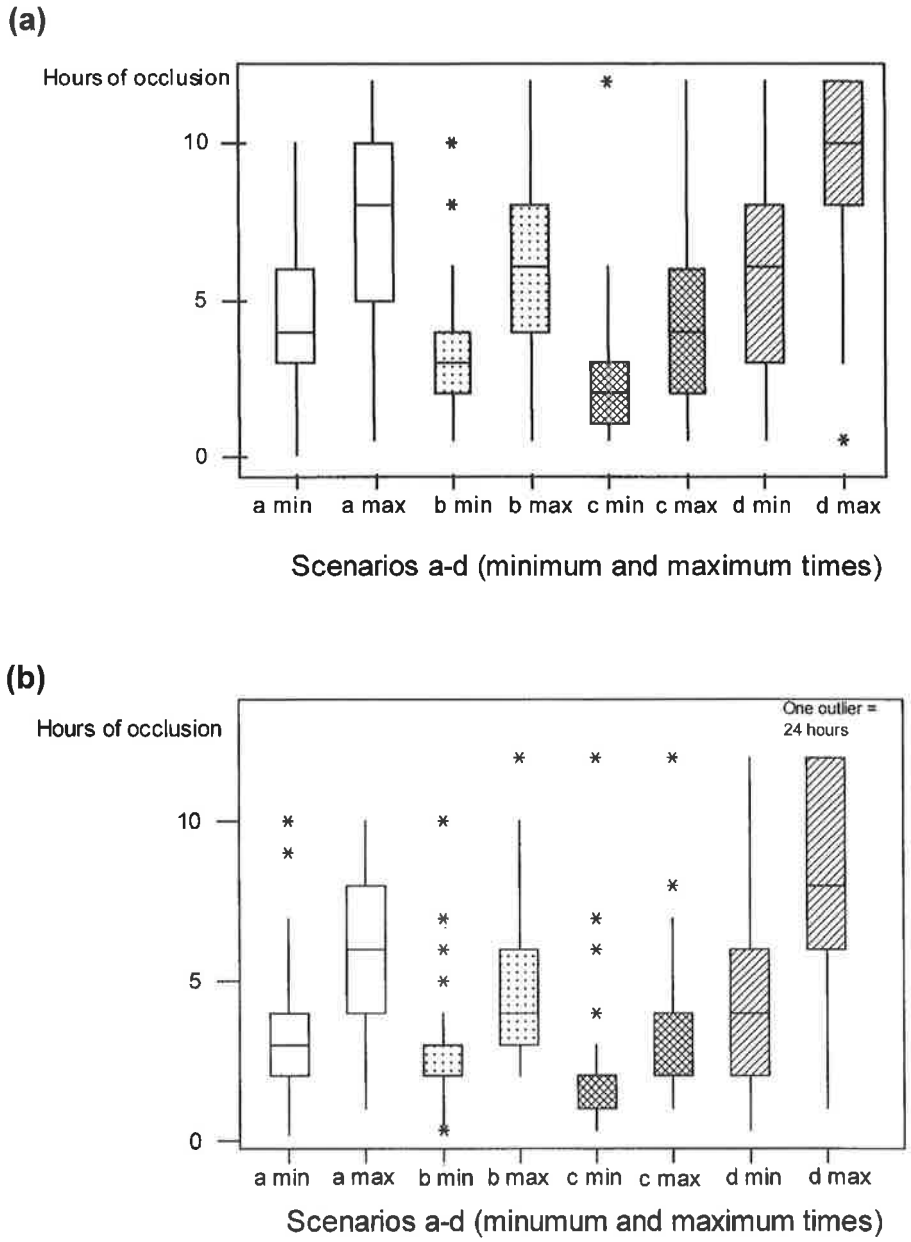

Fig. 2. Minimum and maximum hours of occlusion plotted for the four clinical scenarios for (*a*) the 'with guidance' departments and (*b*) the 'without guidance' departments. The line inside the box represents the median value (the median values in graph (*b*) for scenario (c) were minimum occlusion 2 hours, maximum occlusion 4 hours). The length of the box represents the interquartile range and contains 50% of the data. The whiskers protruding from the box go to the smallest and largest values. Any values that are quite different from the remainder of the responses appear as asterisks.

Table 1. Significance of differences between the 'with guidance' and 'without guidance' departments in the amounts of minimum and maximum occlusion prescribed for the four clinical scenarios

Scenario	*p* value
a minimum	0.002*
a maximum	0.027*
b minimum	0.063
b maximum	0.005*
c minimum	0.067
c maximum	0.480
d minimum	0.0002*
d maximum	0.007*

*Mann-Whitney test significance: $p < 0.05$.

department groups in two of the clinical scenarios (a and d). Interestingly, both of these scenarios were examples of severe amblyopia (6/60 vision): in children aged 2 years (scenario a) and 5 years (scenario d). The 'with guidance' departments prescribed significantly more occlusion in both scenarios than the 'without guidance' departments. Scenarios (b) and (c) were examples of less severe amblyopia and, with the exception of maximum occlusion in (b), there was no statistically significant difference in the occlusion regimes of the two department groups.

Two recent RCTs have investigated occlusion regimes in amblyopia treatment. The Pediatric Eye Disease

Investigator Group looked at the efficacy of less intensive occlusion treatment regimes: (i) 2 hours versus 6 hours[11] and (ii) 6 hours versus 'full time'.[12] They concluded that similar improvements in visual acuity can be gained from *less* intensive occlusion regimes and that the degree of improvement did not depend on the type of amblyopia. Similarly, Stewart *et al.*[17] have concluded from the ROTAS study that substantial (6 hours a day) and maximal (12 hours a day) doses of occlusion provide equivalent improvement in visual acuity. They also found that concordance (compliance) for the maximal occlusion group was poorer than for the substantial group, and this is an important consideration when prescribing occlusion treatment. These studies highlight the need for good-quality research in this area.

It is interesting to consider what proportion of orthoptists think about research evidence when making a treatment decision. If we do, how systematic, thorough and up to date are we about assimilating that evidence, given the time constraints placed upon us? The literature on the treatment of amblyopia is frequently conflicting. Consequently it is difficult for clinicians to apply this information in their clinical practice or develop local, written guidance.

Fortunately systematic reviews of literature are becoming more widespread. A systematic review is a structured examination of the available evidence for the effectiveness of a specific healthcare intervention; the aim is to describe what treatments are available and how well they work.[18] On behalf of the Cochrane Eyes and Vision Group, clinicians are currently undertaking systematic reviews for different interventions in various types of amblyopia. The evidence-based approach to clinical practice seeks to guide decision-making and, as more good-quality evidence becomes available on the treatment of amblyopia, our clinical practice should change to reflect this.

Conclusion

Only one-third of the UK orthoptics departments that responded to the study had some form of written guidance for the treatment of amblyopia. There was a wide variation in the amounts of occlusion prescribed by departments 'with guidance' and 'without guidance' and for the scenarios of severe amblyopia these differences were significant. The importance of a systematic review of the literature on amblyopia treatment and the need for high-quality, robust evidence on which to base clinical practice is evident.

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