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Development of a screening service for neonatal ear deformity using neonatal hearing screeners and an information leaflet

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ABSTRACT

Objectives: Early splinting of neonatal ear deformities has been proven to be successful but the opportunity to splint is frequently missed due to lack of awareness amongst healthcare personnel. We aimed to develop a regional screening service using neonatal hearing screeners and an information leaflet to allow for the early detection and treatment of such children.
Methods: We created an information leaflet that was distributed by hearing screeners to all parents in Greater Glasgow at the time of the child's neonatal hearing assessment, with a contact number allowing parents to self refer. All neonates referred were seen at a dedicated clinic within a week and suitability for splints determined. We aimed to assess acceptability of the service, splinting result as rated by parents and otolaryngologist and also costs involved.
Results: Over a 15 month period, 13,403 leaflets were distributed. 88 babies were referred (0.7%) and 54 were found suitable for splinting. 78% of parents rated the efficacy of splints as either excellent or very good and 96% said they would recommend the service to a friend. Median age at first review was 4 days. We found a weak but statistically significant correlation between age at first review and the surgeon rated outcome from splinting (Spearman's rho = −0.321, $p = 0.038$), with those babies commencing treatment early generally having a better splinting result. We also found that age at first review correlated with duration of splinting required (Spearman's rho = 0.357, $p = 0.008$), with younger babies generally requiring shorter splinting times. Cost analysis revealed a saving of £482.76 per child when comparing splint treatment to potential later corrective ear surgery costs.
Conclusions: Our screening service is both acceptable to parents and efficient in allowing for early correction of ear deformity in the majority of cases. By detecting treatable children early, we propose that the introduction of routine screening and splinting on a wider basis will avoid the psychological burden of ear deformity in childhood and also avoid the need for later corrective surgery.

1. Introduction

Ear deformities are common in neonates and represent a spectrum of different disorders including prominent ears, Stahls bars, rim kinks, cryptotia and lop ears. Although true incidence is unknown, estimates suggest between 1 and 5% of the population are affected [1,2]. Such deformities can be corrected surgically when the child is older, although this can be with variable results [3,4] and occasionally significant complications [4].

The cartilage of the newborn ear is incredibly pliable due to the influence of circulating maternal oestrogen [5] and can be easily moulded to change appearance. Non-surgical correction of ear deformities with splints was first developed in the 1980s by Japanese plastic surgeons [6] and since then has been proven to be a safe and effective non-surgical treatment [2,7–10]. Although some authors have reported success with splints in older children, general opinion remains that treatment is more effective when commenced early, ideally within the first few weeks of life [1,6–8,10].

In our large Scottish tertiary referral paediatric otolaryngology service, we had found that awareness of splint treatment was low amongst parents and other healthcare personnel. We received only 3–4 referrals each year for splinting and almost all were referred routinely, often missing the narrow window of opportunity to start treatment. In Glasgow 97% of all newborns undergo hearing testing by a hearing screener, usually 24–48 h after birth [11]. We felt that this was an ideal time and opportunity to screen for deformity to allow for earlier identification and treatment of affected children.

2. Methods

2.1. Developing a screening tool

First we consulted with the Glasgow neonatal hearing screening team to develop a method by which to screen. At first, we

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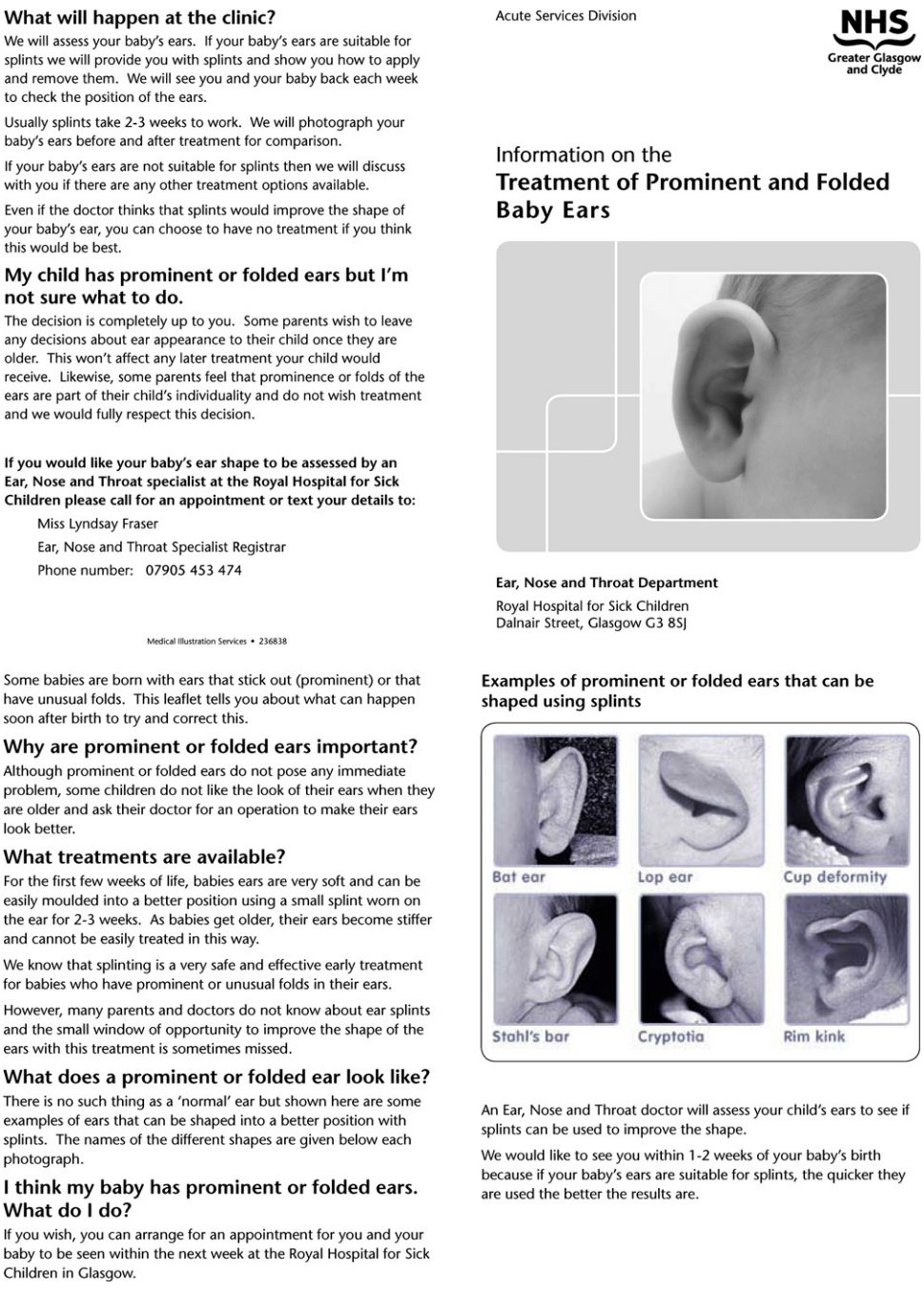

What will happen at the clinic?

We will assess your baby's ears. If your baby's ears are suitable for splints we will provide you with splints and show you how to apply and remove them. We will see you and your baby back each week to check the position of the ears.

Usually splints take 2-3 weeks to work. We will photograph your baby's ears before and after treatment for comparison.

If your baby's ears are not suitable for splints then we will discuss with you if there are any other treatment options available.

Even if the doctor thinks that splints would improve the shape of your baby's ear, you can choose to have no treatment if you think this would be best.

My child has prominent or folded ears but I'm not sure what to do.

The decision is completely up to you. Some parents wish to leave any decisions about ear appearance to their child once they are older. This won't affect any later treatment your child would receive. Likewise, some parents feel that prominence or folds of the ears are part of their child's individuality and do not wish treatment and we would fully respect this decision.

If you would like your baby's ear shape to be assessed by an Ear, Nose and Throat specialist at the Royal Hospital for Sick Children please call for an appointment or text your details to:

Miss Lyndsay Fraser

Ear, Nose and Throat Specialist Registrar

Phone number: 07905 453 474

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Acute Services Division

NHS Greater Glasgow and Clyde

Information on the Treatment of Prominent and Folded Baby Ears

Ear, Nose and Throat Department

Royal Hospital for Sick Children
Dalnair Street, Glasgow G3 8SJ

Some babies are born with ears that stick out (prominent) or that have unusual folds. This leaflet tells you about what can happen soon after birth to try and correct this.

Why are prominent or folded ears important?

Although prominent or folded ears do not pose any immediate problem, some children do not like the look of their ears when they are older and ask their doctor for an operation to make their ears look better.

What treatments are available?

For the first few weeks of life, babies ears are very soft and can be easily moulded into a better position using a small splint worn on the ear for 2-3 weeks. As babies get older, their ears become stiffer and cannot be easily treated in this way.

We know that splinting is a very safe and effective early treatment for babies who have prominent or unusual folds in their ears.

However, many parents and doctors do not know about ear splints and the small window of opportunity to improve the shape of the ears with this treatment is sometimes missed.

What does a prominent or folded ear look like?

There is no such thing as a 'normal' ear but shown here are some examples of ears that can be shaped into a better position with splints. The names of the different shapes are given below each photograph.

I think my baby has prominent or folded ears. What do I do?

If you wish, you can arrange for an appointment for you and your baby to be seen within the next week at the Royal Hospital for Sick Children in Glasgow.

Examples of prominent or folded ears that can be shaped using splints

Bat ear | Lop ear | Cup deformity

Stahl's bar | Cryptotia | Rim kink

An Ear, Nose and Throat doctor will assess your child's ears to see if splints can be used to improve the shape.

We would like to see you within 1-2 weeks of your baby's birth because if your baby's ears are suitable for splints, the quicker they are used the better the results are.

Fig. 1. Information leaflet handed out to parents at time of neonatal hearing assessment. Back and front pages (top) and inner pages (bottom).

considered training the hearing screeners to identify common treatable pinna deformities at the time of performing AABR (automated auditory brainstem response). However the group felt uncomfortable with this, as they were concerned that some parents may take offence to having a deformity pointed out. Likewise, many felt uncomfortable at the thought of fitting splints or answering questions as they are trained solely to perform hearing screening and have no other medical or nursing training.

Instead the group suggested developing an information leaflet that could be handed out to all parents at the time of hearing screening. In response to this, we developed a leaflet containing photos of common correctable ear deformities, some background information about splints and a contact phone number allowing parents to self-refer their baby for assessment by an otolaryngology doctor if they wished (Fig. 1). The study design was submitted to the local research and ethics committee and was approved as clinical audit.

2.2. Screening process

The leaflet was given out to all new mothers in Greater Glasgow between 1 December 2010 and 24 February 2012 by the baby's hearing screener at the time of the neonatal hearing assessment. All new referrals were seen within 1 week at the Otolaryngology clinic, at which point the child's ears were assessed and suitability for splint treatment determined. If suitable, photographs were organised and the parents were provided with splints and shown how to reapply the splint and tapes. We used Ear Buddies^{TM}splints, which are commercially available in the UK and consist of a wire core segment in a 6-French silastic tube held in place with adhesive