

British Association for Paediatric Otorhinolaryngology (BAPO)

Abstracts from the meeting 21 October 1994

The 4th Annual Meeting of BAPO was held at the Institute of Child Health, London on Friday 21 October 1994.

Realization of a Trial of True Outcomes in Surgery

J. Birkin, G. Browning, J. Higson, K. Bennett, M. Gannon, T. Richmond, M. Haggard.

From the MRC Institute of Hearing Research, University Park, Nottingham NG7 2RD

It is well known that grommet insertion (VT) and adenoidectomy (AD) can improve the condition of the ear and hearing in children with histories of OME. It is not known to which children such operations should be given on cost-effectiveness grounds, nor what the health gain is in terms of the child's development and quality of life for the family. This knowledge is now urgently needed because recent scepticism in public health circles about some allegedly over-high intervention rates has led, via purchaser pressures, to reduction in the numbers of operations arbitrarily.

TARGET 1 is a large multicentre trial of VT versus VT + AD which will make a major contribution to the knowledge needed. (Eligible children will be aged 3.5-7 years, have B+B or B+C2 tympanograms and hearing thresholds greater than 20 dB HL on two occasions three months apart.) It incorporates both traditional clinical outcomes and behaviour problem ratings - apparently the main ingredient of parental satisfaction. Realization of TARGET 1 in 9 UK hospitals has involved elaborate preparations, because of requirements for:

- a high degree of uniformity of procedures.
- consensus among 11 collaborating clinicians on equipoise and clinical aspects of the implementation
- precise data, some complex
- the highest regulatory standards
- centralized, balanced randomization
- the need for visibly uniform impartial information and fully informed consent.

Preparation for the trial has shed interesting light upon how parents view the difficulty which uncertainty imposes upon the treatment recommendation in individual cases. Uncertainty does not translate automatically into acceptance of randomization, but tends to a preference for non-intervention initially.

A process of careful explanation (with the International Hearing Research (IHR) randomization video) now provides a more balanced picture to encourage parental compliance.

The trial is now underway and all centres have a steady recruitment of children at Visit 1. At Visit 2 (after a three month observation period), parental acceptance of randomization is high. Due to the design requirement not to publish interim data, results will be available some 12 months after randomization is complete.

Cranio-metaphyseal and Cranio-diaphyseal Dysplasia Otolaryngological Presentations and Management

Aurelia Richards, Caroline Brain*, M. J. Dillon*, C. M. Bailey.

From the Departments of Otolaryngology and Medicine*, Great Ormond Street Hospital for Children NHS Trust, London.

Cranio-metaphyseal and cranio-diaphyseal dysplasia are rare syndromes with multiple ENT symptomatology from an early age. The diagnostic distinction can now be made radiologically by serial skeletal survey. We review the clinical, radiological, CT scan, otological, audiological and histopathological findings in two cases with cranio-diaphyseal and two cases with cranio-metaphyseal dysplasia as well as the medical and surgical treatment to date.

In cranio-diaphyseal dysplasia, temporal bone CT scans showed narrowing of the middle ear cavity, internal auditory meatus, and facial nerve canal at the geniculate ganglion. The hearing abnormality progressed from an initial conductive to a mixed loss on serial audiometric follow-up. Benefits from choanal stenosis surgery, craniofacial remodelling, and dacryocystorhinostomy were shortlived. Calcitriol therapy with a low calcium diet did not alter the clinical course of progression in our cases. Increased osteoblasts were found in bone biopsies from both cases with cranio-diaphyseal dysplasia, but not those with cranio-metaphyseal dysplasia. The underlying defect causing net bone formation in these phenotypically similar syndromes appears to be different in view of the differing biochemical responses to calcitriol and the bone biopsy findings.

The literature suggests that therapy directed at the underlying bony defect has the best chance of success if initiated in infancy. Early diagnosis by

otolaryngologists is therefore crucial for the early commencement of medical therapy, when considering surgery and for prognosis.

Cytochrome P450 Mono-oxygenase Inducers Modify Oestrogen Metabolism: Are They a Potential Therapeutic Agent in the Control and Prophylaxis of Laryngeal Papillomatosis in Children?

W. Colquhoun-Flannery, F.R.C.S., J. A. S. Carruth, M. A., Ph.D., F.R.C.S.

Department of Otolaryngology, Southampton General Hospital, Southampton.

Altering oestrogen metabolism is a potential therapy for recurrent respiratory papillomatosis (RRP).

Oestradiol is metabolized by hydroxylation which occurs at either carbon 16 or carbon 2. The predominant active metabolite is 16 hydroxy, whereas 2 hydroxy, the inactive metabolite, is at much lower levels.

The active metabolite is associated with abnormal DNA replication and colony formation. Elevated levels and human papillomavirus (HPV) infection are seen in cervical carcinoma. Levels are also high in the normal larynx and still higher in RRP.

The inactive metabolite is associated with decreased malignant potential. Can oestradiol be shunted into the inactive pathway? Indoles shunt oestradiol into the inactive pathway by inducing cytochrome P450 enzymes.

Would increasing levels of the inactive metabolite protect against diseases associated with high levels of the active metabolites?

Recently, rat laryngeal tissue was infected with HPV (Newfield *et al.*, 1993) and the rats divided into two groups, one fed a standard diet, the other the same diet plus indoles. Without indoles, all the rats developed papillomata; with indoles added, 75% of the group remained disease free.

RRP may respond better to a dual therapy of P450 inducer and an antiviral agent, to treat the twin causes of abnormal cell division and repair.

Reference

Newfield, L., Goldsmith, A., Bradlow, H. L., Auburn, K. (1993) Estrogen metabolism and the human papillomavirus-induced tumors of the larynx: chemoprophylaxis with indole-3-carbinol. *Anticancer Research* **13**: 337-342.

Paediatric Myringoplasty Outcomes by Site of Perforation

D. A. Nunez, S. S. Hehar, K. P. Gibbin.

From the Department of Otorhinolaryngology, Head and Neck Surgery, University Hospital, Nottingham NG7 2UH

The importance of the site of a tympanic defect in determining the outcome of myringoplasty is controversial. Recent work suggests that eustachian tube dysfunction is more commonly associated with posterior perforations, which illustrate poorer myr-

ingoplasty results (Gimenenez and Marco-Algarro, 1993). The paediatric population in whom eustachian tube dysfunction is prevalent, is the ideal test population for this hypothesis.

Paediatric myringoplasties performed between 1991 and 1993 were reviewed. Cases were excluded if, they were revision procedures, there was evidence of cholesteatoma or other surgical procedures were undertaken at the same time. Tympanic membrane defects were classified as posterior, when they occupied only the area behind a line drawn in a supero-inferior direction through the handle of the malleus. A myringoplasty was defined as successful, if an intact tympanic membrane without evidence of retraction pocketing was obtained.

Thirty-five myringoplasties in 34 children, mean age 10 years (range 6-16 years) were analysed. The perforation varied in size from 10-70 per cent of the tympanic membrane surface area. Eight cases were classified as posterior and 27 as other. Two posterior and 14 perforations at other sites were successful ($p > 0.05$). Posterior perforations in the paediatric population are not associated with a statistically significant poorer prognosis.

Reference

Gimenenez, F., Marco-Algarra, J. (1993) The prognostic value of mucociliary clearance in predicting success in tympanoplasty. *Journal of Laryngology and Otolaryngology* **107**: 895-897.

Lower Respiratory Tract Symptoms in Paediatric Rhinitis

Aloke Agrawal, Glenis Scadding.

From the Royal National Throat, Nose and Ear Hospital Trust, London

It has been estimated that between 66 and 80 per cent (Scadding, 1994) of asthmatics also have rhinitis. The incidence of asthma in rhinitis patients is less certain but a figure of 50 per cent over all age groups was suggested recently (Brydon, 1994). In order to assess the prevalence of asthma and the response to nasal therapy of lower respiratory symptoms a retrospective study was made of 166 new patients attending the Paediatric Rhinitis Clinic at the Royal National Throat, Nose & Ear Hospital Trust. One hundred and two (61 per cent) of these children (aged under 12 years) had symptoms pertaining to the lower respiratory tract with a duration of six months \rightarrow six years, mean three years. Ninety-seven per cent of children aged $<$ three years (76 of 78) had lower respiratory tract symptoms as well as rhinitis. Thirty two of the 166 had a formal diagnosis of asthma, 28 of these were on anti-asthma therapy.

Peak flow measurement on 96 children showed 32 had single peak flow levels below the 95 per cent confidence limits. Fifteen of these 32 were not on any asthma treatment. Nine of the 16 children not previously diagnosed as asthmatic, who kept daily peak flow diaries, showed greater than 20 per cent diurnal variation.

The effect of nasal treatment (allergen avoidance

and intranasal corticosteroid or cromoglycate) on asthma was assessed: over two thirds of children showed an improvement in symptoms and peak flow.

Conclusion

In this population approximately 25 per cent of children with rhinitis (i.e. about 40 per cent of those children with lower respiratory tract symptoms) also had asthma.

References

- Scadding, G. K. (1994) The coexistence of upper and lower airways disease. *Respiratory Disease Practice* **11**: 2.
 Brydon, M. (1994) The coincidence of rhinitis and asthma. *Clinical and Experimental Allergy* (in press).

Electrocautery Dissection Tonsillectomy

A. K. Tewary, F.R.C.S., H. R. Cable, F.R.C.S.
 From the Department of Otolaryngology, Warwick Hospital, Warwick.

Conventional tonsils are removed by sharp and blunt dissection. Although diathermy is often used to achieve haemostasis at the end of the procedure, it is also possible to perform the tonsillar dissection with diathermy.

Materials and methods

Fifty patients undergoing elective tonsillectomy were entered into this randomized prospective trial. They consisted of 14 children aged 6–12 years, eight boys, six girls and 36 adults, 22 men and 14 women aged 18–25 years.

One tonsil was removed by diathermy dissection and the other by conventional sharp dissection. Allocation of a particular procedure to one side, and the side to be operated upon first were randomly selected.

Assessment of blood loss

Suction was not used except to remove excess palatal secretions. A swab was placed in the postnasal space to catch the blood trickling there. One tonsil was removed and haemostasis completed before starting the other side. Swabs on each side were weighed and compared to their dry weight measure blood loss. Each side was unobtrusively timed by the floor nurse.

Pain was assessed by asking the patient to select the more painful side on the first and seventh post-op day.

Results

Bleeding was significantly less with diathermy dissection (Mean blood loss — 14:52 mls, *t*-test: paired two sample for means $t = 8, p = 0$). Diathermy dissection was also consistently and significantly quicker to perform ($p = 0$). There was no difference in the proportion of painful sides selected for the two

procedures. The incidence of haemorrhage was too small (one reactionary and two secondary) for meaningful comparison.

Discussion

Diathermy dissection tonsillectomy is associated with a smaller amount of blood loss. Although this is probably not clinically relevant in most adults, the amount of blood loss saved is a significant proportion of the blood volume in children.

Conclusion

Operative and early post-operative results of tonsillectomy by diathermy dissection compare favourably with conventional tonsillectomy.

Acoustic Rhinometry and Preoperative Assessment of Adenoids

Edward W. Fisher*‡, Niall J. Daly*, Christopher R. Palmer†, Valerie J. Lund‡
 From the Department of Otolaryngology*, Addenbrooke's Hospital, Cambridge, University of Cambridge† and the Royal National Throat, Nose and Ear Hospital‡, London.

Claims have been made for the potential of acoustic rhinometry (AR) in the evaluation of adenoidectomy patients. We set out to establish whether acoustic rhinometry studies could correlate well enough with operative decision-making for it to be of assistance to the clinician, despite several theoretical and practical obstacles.

One hundred and one patients aged two to 13 years were examined by acoustic rhinometry using the impulse technique. At least three clicks per nostril were recorded (both decongested and non-decongested) and parameters chosen from the area-distance function to indicate nasopharyngeal volumes. This information was compared with findings at examination under anaesthesia (EUA obstruction categories: A — 'good airway' to D — 'severe obstruction') and operative decision (two categories — 'obstructive' = remove, versus 'non obstructive' = leave in situ) and adenoid volume.

There was considerable overlap between the acoustic rhinometry parameters in the groups classified at EUA as 'obstructive' or 'non obstructive', but this overlap diminished considerably after decongestion. Multiple logistical regression models demonstrated that the decongested volume and area parameters were the only factors which were of significant predictive value with respect to operative decision.

Acoustic rhinometry has genuine potential as a pre-operative evaluation of the nasopharyngeal airway in adenoidectomy candidates. Despite the existence of the inevitable 'grey area', useful information *can* be gained in many children, and several could be saved from unnecessary surgery or conversely recommended surgery with more confidence on the basis of rhinometric assessment.

Tracheostomy and the Progression of Acquired Subglottic Stenosis-Abstract

J. Hadley, D. Albert, B. Djazaeri.

From the Great Ormond Street Hospital for Children, NHS Trust, London.

The management of the child with acquired subglottic stenosis usually involves the creation of a tracheostomy to protect the airway whilst the child outgrows the problem. Animal experimentation and clinical observation suggest that the presence of a tracheostomy might be associated with the progression of the stenosis.

This retrospective study of 6324 endoscopies identified 20 patients with acquired subglottic stenosis, on whom information was available about the diameter of the subglottic pre- and post-tracheostomy. In nine patients, the stenosis was found to become tighter after the creation of the tracheostomy, in seven patients there was no change in the diameter, and in only four patients was the diameter increased in size ($p < 0.05$ per cent, Wilcoxon match pairs test). There was no statistically significant difference in the length of time between tracheostomy and the second assessment of subglottic diameter comparing the two groups showing a change in subglottic diameter ($0.5 > p > 0.1$, Student's t test).

Ascending infection from the tracheostomy is considered to be responsible for this phenomenon, and it lends weight to the argument in favour of one stage laryngotracheoplasty.

Langerhans' Cell Histiocytosis: A Conservative Approach

R. M. Irving, F.R.C.S.*, V. Broadbent, M.R.C.P.†, N. S. Jones, F.R.C.S.‡

From the Departments of Otolaryngology* and Paediatric Oncology† Addenbrooke's Hospital, Cambridge and Paediatric Otolaryngology‡, Great Ormond Street Hospital for Children, NHS Trust, London.

Over a 30-year period 131 cases of Langerhans' Cell Histiocytosis (LCH), treated at two centres were reviewed. During the period of the study the 'modus operandi' has evolved from an aggressive medical and surgical approach to a more conservative approach with a marked reduction in morbidity. We have compared the early results with the results of the present policy and make recommendations for the treatment of head and neck LCH.

Children with multisystem disease are only treated if this is complicated by failure to thrive, constitutional upset or viral organ failure. Our current approach involves initial treatment with prednisolone, followed by etoposide or a vinca alkaloid for those who fail to respond. Systemic treatment, if indicated, is highly effective in head and neck LCH.

Meatal skin LCH is treated initially with topical steroids, and mustine ear drops have proved to be effective in resistant cases.

Single system disease does not require treatment in the majority of cases. Painful temporal bone lesions are presently treated with intralesional

steroids, and this can be repeated if the disease progresses. Aural polyps are treated by simple polypectomy and intralesional steroids. Temporal bone surgery has now been abandoned in our unit, owing to the unacceptably high rate of complications.

What Proportion of Children Have Otitis Media with Effusion which Resolves By the Time of Surgery?

J. R. Livesey, M.A., F.R.C.S.

From the Department of Otolaryngology, Royal Infirmary, Sunderland.

Responding to the Effective Health Care paper on otitis media with effusion (OME), waiting times for myringotomy and outcome were audited to determine the number of children no longer requiring surgery. Ninety-six children listed for myringotomy and possible grommet insertion were recruited consecutively on admission. Children with a normal pre-operative otological and tympanometric examination had their procedure cancelled. The operative findings and surgical procedures were noted. An analysis of variance was used.

The mean waiting time was 21.4 weeks. Eight patients had normal otoscopy and bilateral A tympanometry, however, only two were cancelled. Fourteen patients had bilateral dry myringotomies (three due to a bilateral nitrous oxide effect). Eleven could have been cancelled: six bilateral type A's (above), five unilateral type A's and contralateral non-B tympanograms. Overall 13 could have been cancelled pre-operatively ($p < 0.01$). They had waited a mean of 34 weeks for surgery ($p < 0.01$, 95 per cent confidence interval for mean of 16.8–51.2).

In conclusion, a significant number of children admitted for myringotomy had resolution of their OME by the time of surgery. A preoperative assessment clinic would allow 'Watchful waiting on a provisional waiting list' as advocated by the Effective Health Care paper.

Reference

Effective Health Care (1992) No. 4. The treatment of persistent glue ear in children. Her Majesty's Stationery Office.

Overnight Pulse Oximetry in Normal Children and in Children Undergoing Adenotonsillectomy

Gwyneth Owen, F.R.C.S., M.S., Richard Canter, F.R.C.S.

From the Department of Otolaryngology, Royal United Hospital, Bath.

Significant hypoxia has been demonstrated during sleep in children admitted for adenotonsillar surgery (Stradling *et al.*, 1990; Van Someran *et al.*, 1990). This study compares overnight pulse oximetry in a population of normal children with those undergoing adenotonsillectomy.

Overnight pulse oximetry (Ohmeda Biox 3700e) was performed at home in 222 children randomly

selected from the town of Frome, Somerset, and in 33 children awaiting adenotonsillectomy prior to surgery, in hospital on the eve of surgery and again at home three months post-operation.

Comparison of oxygen saturation data between each of the four populations above failed to detect a clinically significant difference in any of the following parameters, mean, median, mode, maximum, minimum, upper and lower quartiles, fifth centile level and the average number of >4% per cent dips in oxygen saturation level per hour.

TABLE I

LEVEL OF OXYGEN SATURATION ABOVE WHICH 95 PER CENT AND 99 PER CENT OF ALL SaO₂ VALUES LIE. FROM SUBJECTS (N = 222) FROM BIRTH TO TEN YEARS OF AGE

| Statistic | Oxygen saturation | |
|---------------------|---------------------------------------|---------------------------------------|
| | Oxygen saturation (%) 95% value | Oxygen saturation (%) 99% value |
| Mean | 96 | 94 |
| Median | 96 | 95 |
| Mode | 96 | 95 |
| Maximum | 99 | 98 |
| Upper quartile Q3 | 97 | 96 |
| Lower quartile Q1 | 96 | 94 |
| Minimum | 81 | 73 |
| Fifth centile | 94 | 89 |
| Av no. > 4% dips/hr | 4.9 | 9.0 |

Normal values for overnight pulse oximetry in children are reported (Table I). Snoring was reported in 76 per cent of subjects undergoing adenotonsillectomy compared with 11 per cent in normal children. Sleep apnoeic episodes occurred in 52 per cent of children prior to surgery compared with eight per cent in the normal population. Overnight pulse oximetry has failed to differentiate children with symptoms suggestive of obstructive sleep apnoea from the normal population. Its use as a screening procedure for obstructive sleep apnoea in children should be used with caution until more is known about its ability to predict significant disease.

References

- Stradling, J. R., Thomas, G., Warley, A. R. H., Williams, P., Freeland, A. (1990) Effect of adenotonsillectomy on nocturnal hypoxaemia, sleep disturbance and symptoms in snoring children. *Lancet* **335**: 249-253.
- Van Someran, V. H., Hibbert, J., Stothers, J. K., Kyme, M. C., Morrison, G. A. J. (1990) Identification of hypoxaemia in children having tonsillectomy and adenotonsillectomy. *Clinical Otolaryngology* **15**: 263-271.

Pseudohypacusis in Children

J. P. Pracy, R. M. Walsh, G. Mephram, D. A. Bowdler.

From the Department of Otolaryngology, Head and Neck Surgery, Lewisham NHS Trust, London.

Pseudohypacusis is a condition in which a hearing loss is exhibited in the absence of any organic disease. Diagnosis follows a detailed history and

careful assessment of inconsistencies in response to clinical and audiological testing. It is usually easier to diagnose in children than in adults, as children are less able to produce consistent erroneous results on repeated testing. However the condition is less frequently diagnosed in children which may be due to a lack of awareness.

We present the findings in ten children with an average age of 11 years and nine months, seen in the past year. They had average pure tone thresholds of 55 dB in the right ear and 54 dB in the left ear. All of the children underwent repeat pure tone audiometry and speech audiometry. In nine cases the speech audiograms revealed normal thresholds. Following further counselling and repeat testing, the children achieved normal pure tone thresholds within a month. In the other case the speech audiogram revealed a mild hearing loss, confirmed on subsequent pure tone testing as a 30 dB low frequency sensorineural deafness.

It is our opinion that the diagnosis can be achieved by an increased awareness and confirmed by speech audiometry. Following this, reassurance and continued monitoring leads to a complete resolution of symptoms in the majority of cases, without the need for psychiatric assistance. We believe that speech audiometry is the investigation of choice with evoked response audiometry reserved for recalcitrant cases.

Neutrophil Elastase - $\alpha 1$ - Antitrypsin in Middle Ear Fluid in Chronic Otitis Media with Effusion

P. A. Tierney, F.R.C.S., B. Chan, B.Sc., D. Samuel, F.R.C.S., D. M. Thomas, F.R.C.S., K. S. Patel, F.R.C.S.

From the Departments of Otolaryngology-Head and Neck Surgery and Paediatrics, St Mary's Hospital, Praed Street, Paddington, London W2

Neutrophil elastase was quantified in samples taken from middle ear effusions collected at operation from 17 children attending for elective myringotomy and grommet insertion. At the time of surgery the effusion was classified as serous or mucoid by a single observer. Children with a recent history of infection or antimicrobial therapy were excluded. The quantification of immunoreactive neutrophil elastase was by means of enzyme-linked immunosorbant assay (ELISA). The mean value of neutrophil elastase was 50.6 ± 38.3 (SD) $\mu\text{g/ml}$ in mucoid effusions, which was significantly higher ($p < 0.05$) than that in serous effusions (5.3 ± 4.8 $\mu\text{g/ml}$). These results indicate that a mucoid effusion may reflect a more severe inflammatory response and that persistence of neutrophil activity in the middle ear mucosa may contribute to the persistence of at least one group of middle ear effusions. The presence of higher levels of this serine protease may also provide an explanation for the more prominent mucosal changes seen in mucoid effusions.

Management of Retraction Pockets of the Pars Tensa in Children by Excision and Ventilation Tube Insertion: A Pilot Study

R. M. Walsh, J. P. M. Pracy, D. A. Bowdler.

From the Department of Otolaryngology, Lewisham Hospital, London SE13.

Retraction pockets of the pars tensa in children are occasionally progressive and may result in ossicular erosion and cholesteatoma formation, if left untreated. The aim of this pilot study was to assess the outcome following excision and ventilation tube insertion of grade II and grade III retraction pockets. The pocket is excised transmeatally and a Shepard grommet inserted. It is quick, easy to perform, relatively non-invasive and can be undertaken as a day-case. We devised our own classification for retraction pockets which is a modification of Sade's classification (1979), in which grade I represents a simple mobile retraction of the ear-

drum, grade II retraction onto the incudostapedial joint with or without erosion and grade III retraction onto the medial wall of the middle ear cleft.

Eight children (10 ears) with a mean age of 7.2 years were deemed suitable for the study. There were six grade II and four grade III retractions. Nine eardrums healed completely in a mean time of 3.6 months (mean follow-up 16 months) and there was one residual perforation. Two retractions recurred but both of these were only grade I. Clinically, an improvement in hearing was reported in six children (seven ears) and the average air conduction threshold gain for these patients was 17 dB.

In conclusion, although the numbers of patients included in this study are small and the follow-up relatively short, the preliminary findings suggest that this is a beneficial procedure for progressive grade II and grade III retraction pockets in children. A prospective controlled study is proposed.