A RETROSPECTIVE STUDY OF TRAUMATIC TYMPANIC MEMBRANE PERFORATIONS-OUR EXPERIENCE

Dear Editor,

Perforation of tympanic membrane (TM) is a frequent manifestation of ear injury. The common causes include compressional injury due to change in air pressure in the external auditory canal (EAC), fluid pressure, aural instrumentation (inadvertent removal of foreign body and wax), blast injury, forcible valsalva (in thinned out TM) or otitic barotrauma [1,2]. Keller states that a pressure of 25 pounds per square inch is required to rupture the TM[3].

We wish to share our experience of a retrospective study of 39 traumatic tympanic membrane perforations treated at Command Hospital Air Force Bangalore. After confirmation of traumatic perforation of TM a complete ENT checkup was done. The size and site of perforation in relation to the quadrant of TM was noted. Tuning fork tests (TFT), free field hearing (FFH) and pure tone audiometry (PTA) were done to assess audiological function. The margin of the perforation if inverted and ragged at initial presentation was approximated under microscope and any contaminated material or blood clot was cleaned. A sterile cotton ball was kept in EAC. All patients were given a course of oral antibiotics for a week to prevent secondary infection and advised to keep their ears absolutely dry. If the perforation did not heal by the 10th day, its margin was cauterized using trichloroacetic acid (TCA) and a gelfoam piece was kept over the perforation. The patients were advised to put 2 drops of sterile saline twice daily. If required cauterisation was repeated and the patients were then observed for a period of 3 months. With this treatment if TM perforation did not heal then surgical closure of perforation was done by inlay myringoplasty. After the perforation healed TFT, FFH and PTA were repeated and compared with previous results.

Out of 39 cases studied males were 33 and females were 6. Left ear was affected in 27 cases and right ear in 12 cases. Mode of injury included (i) compressional injury (slap), 27 cases (69.2%), (ii) self inflicted injury (self cleaning), 5 cases (12.8%), (iii) accidental injury (fall etc.), 4 cases (10.3%) and (iv) iatrogenic injury (aural syringing/instrumentation), 3 cases (7.7%). The site of TM perforation was (i) postero-inferior quadrant in 28 cases (71.8%) (ii) antero-inferior quadrant in 8 cases (20.5%) (iii) postero superior quadrant in 3 cases (7.7%) and (iv) None in antero-superior quadrant attic region. The size of perforation was limited to one quadrant only, involving approximately 15-20% area of the TM in all cases. Mild hearing loss (25-35 dB) was seen in 33 cases (84.6%) and moderate hearing loss (35-50 dB) in 6 cases (15.4%) involving speech frequencies. After healing of the perforation, hearing returned to near normal in all cases, with no AB Gap. No patient presented with ossicular disruption or injury to inner ear in our study.

Spontaneous healing was seen in 30 cases, healing by TCA application in 6 cases, and healing after myringoplasty in one case. Two patients were lost to the followup.

In our study left ear was affected more due to slap injury from right handed persons. Compressional injury due to slap constituted 69.2% of the cases as compared to the study carried out by Griffin [4] who had only 25.1% cases, as his series included other causes of TM perforation due to swimming and diving accidents, miscellaneous FB injuries, water skiing, blast injuries etc. Out of 27 cases of slap injuries, 24 cases (88.9%) had postero-inferior quadrant perforation. Kerr and Smyth [2] feel that the antero-inferior quadrant is more commonly involved in traumatic perforations due to pressure changes. However, in our study the postero-inferior quadrant was involved in 71.8% cases. This could be explained due to the fact that compressional force strikes posterior part of the ear drum first as compared to the anterior part as (i) the length of the post canal wall is 1-1.5 cm shorter as compared to anterior canal wall due to inclination of TM and (ii) the cartilaginous portion of the ear canal is directed posteriorly, hence the force is directed to the posterior canal wall and travels along the bony canal wall to affect the posterior part of TM first. Hence, we feel that the postero-inferior quadrant is more susceptible to traumatic rupture as compared to anterior part of TM, in cases of compressional injuries due to slap.

Traumatic perforation of tympanic membrane resulting from slap injuries mainly involved the postero-inferior quadrant. There was spontaneous healing in majority of the cases, and the rest healed by TCA cauterisation and myringoplasty. Final healing and hearing results were good.

**Maj J.R. GALAGALI^{*}, Dr. JAYAPRAKASH A REDDY⁺,
GP Capt S.K. NANDA,[#]**

^{*} Graded Specialist (ENT), 155 BH C/o 99APO, ⁺ PG Trainee (ENT) CHAF Bangalore-7, [#] Sr Adv. Professor & Head, Department of ENT, Command Hospital Air Force, Bangalore-7

REFERENCES

1. Brown OE, Meyerhoff WL. Diseases of the tympanic membrane. In: Paparella MM, Shumrich DA, Editors. Otolaryngology: Vol.2, 3rd Ed. Philadelphia: WB Saunders, 1991: 1277-79.
2. Kerr AG, Smyth GDL. Ear Trauma. In: Booth JB Editor. Scott Brown's Otolaryngology, Vol.3, 5th Ed. London: Butterworths, 1987: 172-84.
3. Keller PA Jr. A study of the relationship of air pressure to myringopuncture. Laryngoscope. 1958; 68: 2015-27.
4. Griffin WL. A retrospective study of traumatic tympanic membrane perforations in a clinical practice. Laryngoscope. 1979; 89: 261-82.

USE OF AMOXICILLIN AND CLAVULANIC ACID (AUGMENTIN) IN THE TREATMENT OF SKIN AND SOFT TISSUE INFECTIONS IN CHILDREN

Dear Editor,

This is in reference to article 'Use of amoxicillin and clauvalanic acid (Augmentin) in the treatment of skin and soft tissue infections in children' [1]. Antimicrobials are used to treat infections. Behind this simple statement, lies the most controversial issue of use

of antibiotics in the practice of Pediatrics. Rational use of antibiotics requires that patient receives a drug appropriate to their individual needs, in doses that meet individual requirements and for adequate duration. It is a common observation that physician in an academic institution gives more weightage to the pursuit of scientific commitment, relegating patients relief to a second position. On the other

hand a practicing Pediatrician sways in favour of parents satisfaction and needs, some even at the cost of scientific standards. Both the extremes are irrational and should be decried and an optimal balance between these two responsibilities be maintained.

The authors have evaluated and compared four different drug regimens (augmentin, amoxycillin, co-trimoxazole and erythromycin) in the treatment of skin and soft tissue infections. The antibiotic sensitivity tests of isolates from 200 patients did not include cloxacillin and cephalixin, the two most important antibiotics in the treatment of pyoderma. Further it is observed that 90.5% of *Staph aureus* isolate & 94.2% of *Strep. pyogenes* isolates were sensitive to erythromycin. Clinical clearance after 7 days in children treated with erythromycin (11 mild & 15 moderate cases i.e. 26 cases) was 10 mild & 10 moderate cases. In comparison clinical clearance after 7 days in children treated with augmentin (13 mild & 12 moderate cases i.e. 25 cases) was 13 mild & 8 moderate cases. There seems to be no significant difference in the efficacy of the two regimens. Hence one needs to question whether therapy with augmentin is cost effective?

Demidovich CW et al [2] studied the causative bacterial pathogens of impetigo in children, to compare the effectiveness of three frequently used oral antibacterial treatment regimens and to correlate the antibiotic sensitivity of the bacterial isolates with clinical responses to treatment. Treatment failure (defined by persistence of lesions 8-10 days after initiation of treatment) occurred in 24% with penicillin V, 4% in erythromycin group and nil in cephalixin group. Further they conclude that cephalixin is the most effective treatment, erythromycin estolate is nearly effective and may be preferred on a cost effectiveness basis and penicillin V is inadequate for treatment. In another study of one hundred five *Staph aureus* infection occurring in 79 children, the authors [3] conclude that both erythromycin estolate and erythromycin ethyl succinate produce satisfactory clinical response in nearly all cases including patients with deeper soft tissue infections such as frunculosis and carbunculos. The two cephalosporins used, cephalixin and cefaclor as well

as dicloxacillin also proved to be effective.

The current recommendation for treatment of skin bacterial infection including deep infection is to provide coverage of methicillin sensitive *Staph aureus* with dicloxacillin or first generation cephalosporin such as cephalixin. For penicillin allergy patients, clindamycin or clarithromycin is appropriate [4]. Topical mupirocin applied to the lesion three times is an equally effective alternative to systemic therapy [5]. These recommendation are with the background information that such treatment is necessary despite the facts that the disease is often self limited and that there is no convincing evidence that treating pyoderma will prevent subsequent glomerulonephritis. Added to this is the concept of essential drugs usage advocated by WHO, wherein antibiotics like augmentin is classified as a reserve antibiotic and to be used only in life threatening infections.

Gp Capt TS RAGHU RAMAN *

* Senior Advisor, Department of Pediatrics, Command Hospital (A.F.), Bangalore-560007

REFERENCES

1. Kar PK. Use of amoxycillin and clavulanic acid (augmentin) in the treatment of skin and soft tissue infections in children. *MJAFI* 1997; 53: 87-90
2. Demidovich CW, Wittlen RR, Ruff ME, Bats JW, Browning WC. Impetigo. Current etiology and comparison of penicillin, erythromycin and cephalixin therapies. *Am J Dis child* 1990; 144: 1313-5
3. Disney FA, Pichichero ME. Treatment of *Staphylococcus aureus* infections in children in office practice. *Am J Dis Child* 1983; 137: 361-4
4. Joanne T. Skin ulcer and pyoderma. In: Current therapy of Infectious disease. David Schossberg (ed). Philadelphia, Mosby, 1st edn. 1996: 54-8
5. Ellis LD, Mertz PM, Yvette Piovonetti, Pekoe GM, Eaglsten WH. Topical antibiotic treatment of impetigo with mupirocin. *Arch Dermatol* 1986; 122: 1273-6.

REPLY FROM THE AUTHOR

Although many skin infections in children are still best treated with older agents, several newer antibiotics offer advantages in certain situations. In addition, changes in microbial antibiotic resistance patterns have altered the drug of choice for certain childhood skin and soft tissue infections [1].

Systemic antibiotics to eradicate *Staphylococci* and *Streptococci* are the treatment of choice in skin and soft tissue infections in children [1]. It is now recognised that penicillinase producing staphylococci are more likely to be responsible for impetigo than streptococci and account for 70% to 80% of childhood impetigo [2]. For impetigo secondary to an underlying skin disease, such as dermatitis, scabies, psoriasis or varicella, staphylococci are virtually always responsible [2]. Post-streptococcal glomerulonephritis may follow such infections of the skin if nephritogenic strains of streptococci are involved [3].

Beta-lactamase production is one of the most common forms of resistance to beta-lactam antibiotics. The most recent advances has been the introduction of beta-lactamase inhibitors, which, when combined with existing beta-lactam antibiotics, act synergistically by inhibiting plasmid mediated beta-lactamases of *Staphylococcus aureus* [4].

The antimicrobial spectrum of amoxycillin/clavulanic acid combination make them ideally suited for the treatment of serious infections of the skin and soft tissue when polymicrobial organisms

are suspected [4].

Most topical antibiotics including mupirocin ointment may result in clinical improvement but may prolong the carriage stage of pathogen on the skin [2]. Topical mupirocin ointment should not be used alone but reserved for cutaneous staphylococcal infections such as encountered in immunosuppressed children [5].

It is concluded that amoxicillin-clavulanic acid combination, with good coverage of *Staph aureus* and *Streptococci* is useful in mild skin and soft tissue infections in children or for oral treatment after an impatient course of intravenous antibiotics in moderate to severe skin and soft tissue infections in children [1].

Lt Col PK KAR *

* Classified Specialist (Dermatology & Venereology), 151 Base Hospital, C/o 99 APO

REFERENCES

1. Chapel KL and Rasmussen JE. Pediatric dermatology: Advances in therapy. *J Amer Acad Dermatol* 1997; 36: 513-26.
2. Dagen R. Impetigo in children, changing epidemiology and new treatment. *Pediatr Ann* 1993; 22: 235-39.
3. Markowitz M. Changing epidemiology of group A streptococcal infection. *Pediatr Infect Dis J* 1994; 13: 557-61.
4. Epstein ME, Amodio-Groton M and Sadick NS. Antimicrobial agents for the dermatologist. B-Lactam antibiotics and related compounds. *J*