Evolution of Paediatric Otorhinolaryngology

Paediatric Otorhinolaryngology is a speciality which uses both medical and surgical techniques in the treatment of children suffering from disorders of ear, nose and throat.

Rosen in his monograph "Specialisation in Medicine" describes two processes by which a speciality develops. One is segmentation in which an established speciality divides and the other is accretion where two fields merge. These are usually simultaneous processes. Thus, Paediatric Otorhinolaryngology (ORL) may be considered a segmentation of General ORL and a merging with Paediatrics.

Guest Editorial

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The reason why this speciality has developed in the last thirty-five years, is that Otolaryngologists all over the world have realised that children do not react to the disease in the same way as an adult. It is fundamental to realise that a child is not just a "small adult", and that he is very different anatomically, physiologically and immunologically. Moreover, the rates of growth in different organ systems are different and vary with increasing age.

Socio-economic Reasons

Several medical and socioeconomic conditions influence the development

of a society. Some of them are general ; such as growth of metropolitan cities which will provide centralised services in a speciality. Another is improvement in transport services which can bring the patient from surrounding areas.

Children's Hospitals

The most significant development in Paediatrics was the building of children's hospitals. It is primarily in these institutions that it has been appreciated that children have different medical and social needs. In addition most paediatricians are trained in these unique institutions and their patients require services of many paediatric specialists. The opportunity of both formal and informal encounters exists in such hospitals and this results in an exchange of ideas and information leading to development of new medical and surgical techniques which help to answer problems.

History

The first attempt to stimulate interest in otorhinolaryngological problems of children occurred in Poland in 1930. The pioneer in the field was Professor Jan Danielowicz of Warsaw. Many children with oesophageal stricture were referred to him and he rapidly came to appreciate that they did not react the same way as adults and that they have to be managed in a different way.

After the post Second World War crises. Professor Gatti Mancini of Brescia, Italy, worked hard to build up the speciality in Europe. He founded the European Working Group in Pediatric Otorhinolaryngology (EWGPO). For many years Renato Fior has been the energetic secretary of this group. In 1994, during the VIth and last International Congress of Pediatric Otorhinolaryngology under auspices of the Working Group, in Rotterdam-the Netherlands, the Working Group was substituted by the European Society of Pediatric Otorhinolaryngology (ESPO) under the first presidency of Carel Verwoerd. About the same time, Seymour Cohen of Los Angeles and Charles Ferguson of Boston, both working in children's hospitals, can be considered early leaders and pioneers of pediatric otolaryngology in America.

The foundation of an interdisciplinary group was established in the USA under the presidentship of Robert Ruben, named as Society of Ear, Nose and

Throat Diseases Advances in Children (SENTAC). Subsequently, a study Group under the chairmanship of Charles Bluestone was made.

An initial meeting was then held in Bermuda in 1985 with the formation of the American society of Paediatric Otolaryngology (ASPO) and Seymour Cohen was its first president. This Group which enrolls paediatric otorhinolaryngologists from the USA and abroad, has standardized resident and fellowship programmes at various centres for pediatric ORL.

The International Journal of Paediatric Otorhinolaryngology, with a ranking in the SCI Journal Citation Reports, is now being published as a quarterly. Really international, because the editor-in-chief is Robert Ruben from New York, the editorial board are from all over the world, the journal is edited in the Netherlands and printed in Ireland.

In our country, many otolaryngologists interested in paediatric problems in otolaryngology were invited to present their work at Gujarat State Conference of Association of Otolaryngologists of India which was held at Surat in 1982. This beginning was then followed by an interesting meeting wherein it was proposed to form the Association of Paediatric Otolaryngologists of India and its first national conference was held at Kolar, Bangalore in 1993.

Plasticity of a Child

The development of a child from the otolaryngologist's point of view reveals areas that are critical. The first of these would be the specific plasticity of the developing neonate. This plasticity is of greatest importance in the area of communicative disorders.

Ability to Learn Language

There appears to be a set time when the developing child is able to acquire language. Numerous studies have pointed out that this critical time is between birth and twelve years of life or even earlier. New studies have demonstrated that some impulse of hearing is already given prenatally. The unborn child seems to discriminate voices of mother and father, and even of different languages spoken. It is therefore important that congenital hearing impairment should be diagnosed as early as possible. If the diagnosis is

made late, the consequences are likely to be grave. The child cannot fulfil the expectations and grows up in a singular world—a world in which he is neither understood nor can he understand.

Serous Otitis Media

Another example of plasticity is when the child has minimal to moderate hearing loss like he has in serous otitis media, particularly in the language formative years which will result in poor language and verbal skills. Such a child requires early and proper diagnosis and effective treatment. Plasticity of a child is also seen in the development of his speech and vestibular function.

Development of Mastoid Bone

The anatomical and physiological development of a child is of course basic; but the plastic properties of his growth are still poorly understood. One aspect about which little is written is further growth of the mastoid after surgical intervention. It is unusual for a child of three or four years of age to undergo a modified radical mastoidectomy; it is still unknown what happens to the cavity as the child grows and new bone formation occurs or whether this is related to recurrence of the disease. Formation of cholesteatoma or mucosal cyst. This subject needs further study.

Advances in Biotechnology and Neonatal I C U

Another factor for the development of this speciality is the availability of improved technology. Rapid advances in biotechnology have contributed significantly to the accelerated development of paediatric ORL. With the acquisition of modern equipment for assisted mechanical respiration and development of extracorporeal membrane oxygenation, many low birth weight newborns have been saved. Otolaryngologists have now become an important part of neonatal ICU joining hands with neonatologists, paediatricians and many other paediatric specialists.

Paediatric Airway and Endoscopy

The centre of development of paediatric ORL began in the area of maintenance of the paediatric airway, intubation, tracheostomy and endoscopy. A number of otolaryngologists have devoted their time and skills

to developing safe and effective endoscopic procedures in children with anatomical and physiological constraints.

Paediatric airway by virtue of its geometric small size is susceptible to acute obstruction. The ratio of its circumference to its functional area is 4 : 1 and hence any cause which can produce mucosal oedema in subglottic space will cause acute airway obstruction. This will require immediate help of skilful and experienced hands to establish an airway.

The development of Rod lens telescopes and all sorts of fibre optic rigid and flexible endoscopes with suction cannulas and forceps have improved the ability of an otolaryngologist to diagnose and treat congenital and acquired obstructive lesions of the paediatric airway. Many of these procedures are often life saving.

The modern methods of anaesthesia with constant monitoring the child's heart and oxygen level, and jet ventilation techniques have contributed to a great extent to today's safe paediatric procedures. It is most important to give enough space and time for manipulating the various instruments to the endoscopist. Videography CCTV but also simple photography have helped the practising specialists to document the various lesions and also to learn and teach their juniors.

Breast Feeding and Immunisation

Happily, breast feeding has again become a popular fashion in recent years and hence the child has a period of passive immunity conferred by his mother's milk. This has saved many children from allergic disorders which are usually eleven times more common amongst children who have not been breast fed. Early discharge from maternity wards have also reduced the rate of antibiotic resistant hospital infections amongst the newborns.

Pulse immunisation in developing countries have been included in a national Health Plan. We see very few cases of diphtheria, poliomyelitis and other exanthematous fevers responsible for many necrotising lesions in otolaryngology.

On the other hand, there is a marked increase in tuberculosis and transmitted HIV diseases in children.

Otology and Paediatric Surgery

Two specialities have had a great influence on the evolution of paediatric ORL. One is otology and the other is paediatric surgery. The new diagnostic methods of assessment of hearing has helped us in early diagnosis of a deaf child and eventually in his rehabilitation and management.

Paediatric surgery has taught us the basic concepts in surgical management of children and in the organisation of a health delivery system. With the development of new surgical approaches, the use of new techniques like microvascular reconstruction and the discovery of new antimetabolites the otolaryngologist has gained a great ability to correct congenital deformities, manage various traumatic lesions and remove benign and malignant tumours.

Nasal Endoscopy

The development of paediatric telescopes have helped us in early diagnosing various lesions of the nose and paranasal sinuses. The new techniques of computerised tomography, MRI and contrast studies give excellent anatomical information on the pathology and leads to better management of various diseases which otherwise would be termed hopeless and fatal.

Cochlear Implants and Paediatric Audiology

The other promising field is future development of cochlear implants especially for the deaf child. Various centres in the world are working hand in hand to solve the various intricacies of the biomechanical device and yielding near normal results.

This has also opened up new vistas for the development of paediatric audiology and voice clinics for rehabilitation of certain voice and speech disorders.

Maxillofacial Trauma

A child needs special care after trauma. The blood loss

to be replaced immediately and the airway has to be maintained. Special techniques of wiring and using plates, should keep the fractured parts in alignment and avoid deformity. Special suturing material has reduced scarring. We all know that prompt treatment for nasal bone fractures, can prevent severe nasal deformity with marked septal deviation which we cannot find in adults.

Anterior deviation of nasal septum which is quite common in children can be corrected at an early stage.

Subglottic Stenosis

Several eminent paediatric otolaryngologists have developed surgical techniques to relieve the stenosis and repair the trachea which was otherwise very difficult to treat. This has avoided permanent tracheostomy in many children. Recognizing gastroesophageal reflux as a pathogenic factor in the development of laryngeal stenosis has helped us in its prevention.

Lasersurgery

Extensive clinical experience and anecdotal evidence indicate that application of laser technology has improved the management of many congenital and acquired diseases of the head and neck in pediatric patients. The general principles of lasersurgery, with respect to laser-tissue interaction, must be adhered to at all times to achieve the best surgical effect. Improperly used, the laser easily can damage normal tissue in the infant's or child's larynx, with devastating consequences.

Future

Much of what will be done in future in the area of paediatric ORL will have its results in saving life and restoration of function which will not only enrich the quality of life of an individual child but also that of the physicians who participate in this new area of endeavour.

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