THE LIFELINE EXPRESS - A MOBILE EAR CLINIC FOR RURAL INDIA

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Abstract. The objectives of this study were to review the application and feasibility of providing screening, diagnosis, medical and surgical treatment for patients with ear discharge by setting a mobile hospital in rural India. The study was retrospective. The study involved collection of data from 1992 to 2005 from patients with ear diseases. The number of patients operated on for ear conditions and the distribution of free hearing aids were also recorded. Data regarding length of post-operative stay, complications and graft failure rates was collected from local medical centers and analyzed. Out of 304,321 patients, 4,426 were operated on for ear diseases, mostly ear perforations, grommet insertions and cholesteatoma surgeries. A total of 11,913 audiometric evaluations were done and 9,045 hearing aids were distributed. An overall success rate of 78.8% was achieved for achieving a dry ear and approximately 60% reported significant improvement in audiometric thresholds.

Key words: mobile hospital, lifeline express, ear surgery camps

INTRODUCTION

A recent WHO Report for Southeast Asia listed the prevalence of chronic serous otitis midia (CSOM) at 4 % and in 7.8 % of the population in India (WHO, 2004). India is a country where chronic discharge from the ear is considered a way of life. An important priority in allied healthcare today is the efficient delivery of comprehensive ear care services, especially in underveloped areas of rural India, where there are few hospitals or healthcare personnel.

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Grafting of the tympanic membrane (myringoplasty) is usually performed as an in-patient procedure. Long term follow-up of cases have shown overall success rates of 90% (Glasscock, 1972). However, the concept of ear surgery camps is not very well known. The British Nepal Otology Service (BRINOS), founded as registered charity in 1988, has so far held four ear surgery camps in Nepal, sponsored and organized a nationwide survey of the prevalence and causes of ear diseases and deafness and is sponsoring a pilot scheme in primary care for treating ear disease. Seven thousand outpatients have been seen, 270 major and 170 minor ear operations have been performed in the four ear surgery camps (Weir, 1991). To our knowledge there have been no long-term studies analyzing the provision of ear care

through railroad.

MATERIALS AND METHODS

Project description

It may be difficult to envisage a hospital on rails, hence we will describe the Lifeline Express (LLE) and its function to demonstrate its capabilities and to provide an outline for those who would like to replicate the project.

The Lifeline Express Concept

The concept for the LLE is if disabled persons cannot reach a hospital, the hospital should reach them. This has resulted in the LLE hospital on rails, with the potential to bring health services to the remotest corners of the country. It provides on-the-spot diagnostic, medical and surgical treatment free of charge to patients such as those with polio affected disabilities, hearing and visual handicaps, post burn contractures and cleft lips and palates. Each program requires complex planning and coordination by various bodies. The organization which coordinates this effort is called IMPACT (International Initiative Against Avoidable Disablement) promoted by the UNDP, UNICEF and WHO in association with the governments of each participating region.

Indian railways have an extensive network spanning over 300,000 kilometers cxtending to the remotest areas of the country. This makes it possible to provide service with projects like the LLE.

Four old railway coaches released by Indian Railways have been redesigned and restored by engineering and medical consultants and refurnished into a fully functional, air-conditioned hospital equipped with all modern medical and surgical facilities. It has three operating tables each equipped with state of the art accessories for performing both local or general anesthesia with procedures. There are two autoclaves for sterilization purposes and two powerful generators of 125 KVA for uninterrupted power. The train also has a recovery room, meeting room/conference hall, auditorium for training sessions for upto 50 persons, facilities for performing x-ray, routine laboratory investigations, audiometry, ophthalmic examinations. Surgeries commonly performed include cleft palate repair, polio sequelae repair, cataract, and ear surgeries.

The sponsors for projects include Indian businesses, foundations, institutions, or State or Central Governments. The first step is assessing the needs of a particular area in consultation with the district administration, non-governmental organizations or health officials. After receiving a formal request, assessment of staff services available is made and the dates finalized. If sufficient beds are unavailable at local health centers, local community centers and marriage halls are cleaned and converted into bedded hospitals. Arrangements are made for large outstation health teams for accommodations and food. Indian Railways coordinates movement of the LLE, with parking at sidings along with provision for water, electricity, and leveling of the siding. Medical and paramedical professionals provide their services and expertise on a voluntary basis. Local and national media inform people of the services of the LLE and procure funds from multinational corporations and firms.

Methods

The total camp duration for each specialty is around 7 days. In ear camps, the first 2 days are utilized in conducting outpatient screening for perforations and audiometry services. Unsafe ears, profusely

wet ears and systemically unstable patients are treated medically and referred to the nearest tertiary care centers. The candidates suitable for surgery are medically screened, reevaluated and prepared for surgery after giving informed consent. There is also provision of free monaural hearing aids to severe and moderately hearing impaired patients.

Patients age 12 to 65 years with conductive hearing impairment willing to undergo surgery after clearance are prepared the night before with admission not usually being required. All patients un-

Table 1
Number of cases registered at the 10 project sites during 1992-2004.

Site no.	Project site	State	Duration	Total cases (ear, polio, cleft lip, eye)	Ear cases operated	Hearing aids given
1	Farah	UP	14 Jan-28 Feb 1992	6,152	47	200
2	Gauriganj	UP	14 Mar-28 Apr 1992	5,500	129	140
3	Ruthyai	MP	23 Mar-22 Apr 1995	5,710	75	81
4	Amethi	UP	20 Aug-22 Sep 1995	6,232	45	51
5	Dabra	MP	4 Apr-5 May 1996	5,880	54	100
6	Shivpuri	MP	25 Aug-27 Sep 2000	6,247	83	224
7	Ashoknagar	MP	15 Dec-15 Jan 2003	10,865	201	300
8	Jais	UP	28 Oct-28 Nov 2003	5,618	73	700
9	Shivpuri	MP	10 Mar-6 Apr 2004	8,014	141	350
10	Rewari	Haryana	10 Oct-3 Nov 2004	1,294	124	94
Total				61,512	972	2,240

Table 2
Number of surgical cases, complications and follow-up results.

Site no.	Location	Myringo-plasties/ tympanoplasty	Complications			No. of follow-ups in 6 months	Graft take-ups	A-B gap closure
			Vestibular	Pain	Sepsis			
1	Farah	31	0	2	0	28	18	17
2	Gauriganj	110	0	6	0	108	83	78
3	Ruthyai	52	1	1	0	48	32	34
4	Amethi	30	1	1	1	24	15	20
5	Dabra	34	3	2	0	30	16	18
6	Shivpuri	60	0	4	0	55	40	40
7	Ashoknagar	150	1	5	1	142	124	103
8	Jais	61	0	1	1	54	42	31
9	Shivpuri	156	1	2	2	146	127	101
10	Rewari	102	2	5	1	96	80	47
Total		786	9	29	6	731	577	489

dergo myringoplasty using the classical post-aural route and underlay technique. Patients are kept under observation for 4 hours post-operatively then discharged on oral antibiotics and pain medication. At follow-up the operative surgeon does the evaluation and dressing change. Local specialists, also part of the program, do follow-up from 7 days to 6 months, where a regular note is made of the incidence of discharge, re-perforation and change in hearing. A final report is sent to the administrator of the LLE after 6 months.

RESULTS

Although the LLE has traveled in the whole of India and has conducted more than 70 camps in various places we did an analysis of data from 10 camps attended by medical personnel of our institution. In these 70 camps there were 304,321 registered patients out of which 4,426 were selected for ear surgery and 9,045 hearing aids were distributed.

In the 10 camps attended by our team a total of 61,512 patients were registered and 972 were operated on for various ear diseases, mostly ear perforations (786) (Table 1). Other surgeries performed included grommet insertions for serous otitis media and retraction pockets, tympanoplasties, stapedotomies, preauricular sinus excisions, accessory tragus excisions, and cortical and modified radical mastoidectomies. A total of 2,240 hearing aids were given to patients having moderate to severe hearing loss. Of the CSOM cases, 20.3% had perforations with drainage and 77.2% had dry perforations. One point five percent of patients underwent grommet insertions and 0.6% were operated on for cholesteatoma with a modified radical mastoidectomy. A total of 11,913 audiometric evaluations were done and 2,240 hearing aids were distributed. Another significant finding was the presence of profound hearing impairment in 609 (0.5%) out of 11,913 audiometric evaluations. An overall success rate of 78.9% was achieved for obtaining an ear without drainage, and 66.9% reported significant improvement (>20db) in audiometric thresholds. About 7% of patients were lost to follow-up. Four point seven percent of cases reported mild complications, such as nausea, vomiting or the persistence of ear discharge, which were managed with oral medications. Referrals to tertiary centers for patients requiring specialized care were made in appropriate cases. Patients with problems other than their ears were treated medically and then referred to a facility near the area. Others were referred to nearby government centers.

DISCUSSION

The study shows a mobile hospital, like the LLE, can provide free advanced ear care to rural populations with success rates comparable to when the procedure is performed at routine medical fascilites. The LLE also gives the opportunity for surgeons working in smaller towns to learn advanced skills of microsurgery and provides training for health workers, and doctors regarding health issues. The LLE not only renders a much-needed service but raises the efficiency of the existing local government and voluntary health infrastructure. It allows local helth workers to provide follow-up services after the LLE has departed. It can be a major tool in the National Deafness Control Program for treating preventable deafness in rural India.

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