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Status of Bilateral Cochlear Implantation in Malaysia

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Abstract

Advantages of bilateral Cochlear Implantation (CI) over unilateral implantation in individuals with severe to profound sensorineural hearing loss are well established. In most developed countries, cochlear implant recipients receive full funding for bilateral implantation. In Malaysia, we have been advocating bilateral implantation since 2003.Our objective is to review all cases of unilateral & bilateral implantation that used the Cochlear Nucleus implants (Cochlear Ltd. Australia) and determined the percentage of bilateral implantation & investigate their affordability and sources of funding. Data were collected from all individuals who underwent CI from 1995 until 2013 to determine bilateral or single sided recipients, sources of funding and time interval for both the first and the second implant. 510 individuals underwent CI from 1995 to 2013. Overall, only 34 individuals have bilateral implantation (6.7%). Amongst these, all except one were done after 2003 (93.3%).Time interval of the sequential implantation were 5 months as shortest interval and 15 years as longest interval with an average interval of 3 years. Majority of individuals received full or partial funding from the government for the first implantation. With regards to second implantation, 26 were self funded & 5 were government funding. Less than ten percent of cochlear implant recipients in Malaysia received bilateral implantation. Although bilateral CI is highly recommended, only a small number of individuals can afford bilateral implantation in Malaysia. With increasing advancement of this technology & Malaysia as one of the developing countries, thus advocating bilateral cochlear implant to the government should be strongly pursued.

Keywords

Cochlear implant, Malaysia status of hearing, Bilateral, Funding

Introduction

Cochlear Implant (CI) is an electronic device that is implanted into the ear surgically to provide a sense of sound to the deaf or patients who have hearing impairment. The cochlear implant is different from the hearing aids because instead of amplifying sound, it stimulates the auditory nerves inside the cochlea with an electric wave.

The world health organization estimates that there are approximately over 5 percent of the world's population -360 million people with 328 million adult and 32 million children that are deaf or have hearing problems [1]. The organization has also described hearing related problems as one of the leading causes of social and public health problems. However, with the current advancement in technology it is possible to reduce the number of hearing impairment problems through a procedure known as the cochlear implantation.

Invention of cochlear implant in the past 30 years– has become the standard treatment for people with bilateral severe to profound sensor neural hearing loss. In early years, only individuals with profound bilateral deafness were the candidates for cochlear implants and for only monoaural implantation.

Many cochlear implant operations have been done to over 150,000 people including both children and adults worldwide [2]. There are some factors that should be taken into consideration such as the post-operation rehabilitation, the operation itself and the effects that are related to the operation. For this reason this procedure is relatively expensive and therefore its funding has been a great problem in Malaysia.

This procedure gained popularity with its effectiveness on children with profound sensor-neural hearing loss. Since its introduction in the 1960s, the operation has changed a lot of lives for the people of Malaysia [2,3].

Bilateral CI has become a standard treatment for patients with severe to profound SNHL in developed countries. We all know that bilateral CI show some clear and significant benefits compared to single CI as being mentioned in most of the literature reviews. As in normal hearing persons, directionality of the sound will be able to identify and also build awareness of what is happening in their environment. Moreover, ability to hear a single voice amongst the noisy, busy, vibrant environment will be easier and hearing with two CIs provides a cumulative effect where a person can hear clearer and louder. Language acquirement will be faster in those having a second cochlear implant with combination of directionality, hearing in noise and being able to hear more. Lastly, the major benefit of having a second CI is that, if one breaks down, as all such devices will from time to time – the person will still be able to hear with the presence of a spare ear [4-11].

Dunn C, et al. (2008) states the benefits of acquiring a bilateral cochlear implant as improved speech, greater ease in listening, enhanced sound quality and ease in knowing the direction of sound accurately [6].

Binaural ears give the patient the ability to get the full sphere of sound, deliver it to the brain, get it processed and therefore they will

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be able to respond faster compared to when they can only use one ear. Therefore two ears are better than one [7].

Clinical researchers have proved that a bilateral cochlear implant will not only help the patient in their present day but also in their future [8].

Therefore we are aiming to get funding for patients in need of the bilateral procedure as the main two benefits were accurate identification of direction of sounds and ability to identify source of the sounds in a noisy environment.

A statistic by a local newspaper, The Star in 2011 stated that a ratio of 2:1000 children are born with hearing problems therefore there should be intervention early stages of life [3]. Due to the high cost of the cochlear implant, many patients have not been able to have access to this treatment especially in developing countries. This is because the cost of the procedure puts an financial burden on the patients and their friends and relatives and therefore hastens the development of the cochlear implantation procedure in these countries [3]. Without access to such technology the countries' development is therefore slowed down due to the reduction in manpower and also there will be a significant amount of the government expenditure used on the rehabilitation of the people suffering.

In developed countries, a number of direct costs are not paid by individuals using the cochlear implant. The direct costs refer to the payments that are directly related to the procedure itself such as the cost of the surgery while the indirect costs are third party costs incurred as a result of the cochlear implant such as rehabilitation fee [4]. In fact, for example, in a country like UK, the Tax funded National Health Service for the cost of entire cochlear implant and services [9]. The UK tax service is used to fund patients especially children with hearing problems. The individual affected and their families carry no direct costs for the service.

Objectives

The objectives of the following case study can be summarized as follows

- To determine percentage of bilateral cochlear implantation done in Malaysia amongst those using Cochlear Nucleus implants
- To find out the numbers of simultaneous and sequential cochlear implantation done in Malaysia
- To determine the time interval period for those who underwent sequential cochlear implantation
- To investigate the sources of funding and affordability in those receiving bilateral implants

Methodology

Data collected amongst all patients using Cochlear Nucleus implants in this study from the year 1995 to 2013. The data was collected from two different spread sheets of the Ministry of Health and Pusat Perubatan of University Kebangsaan Malaysia candidates. The total number of patients who received the cochlear implantation, both unilateral and bilateral was recorded. For the patients who received the bilateral implantation, the time interval between the first implant procedure and the second either simultaneous or sequential settings were also recorded. The sources of funding for both the first and second implants were also evaluated in the study.

From the collected data, we gathered;

1) Total number of patients who underwent cochlear implantation

2) Number of patients who had bilateral cochlear implantation

3) Number of patients who underwent sequential cochlear implantation and simultaneous cochlear implantation

4) Time interval period for those underwent sequential cochlear implantation

5) Sources of funding for both first and second implants were also evaluated.

Results

Total number of cochlear implants (1995-2013) done in Malaysia using Cochlear Nucleus Implants were 510. Among all these cases, there were only 34 (6.7%) bilateral cochlear implantation done (Table 1).

Out of the 34 cases of bilateral CI, only 3 were simultaneous and remaining 31 were sequential CI as shown in the table below (Table 2).

It was found that the period between the first and the second procedure for patients who were able to acquire the bilateral cochlear implant varied with an average of 5 months to 8 years period because of the difficulty in securing funding sources. Out of 34 cases, 33 cases of bilateral cochlear implant done were from 2003 onwards, with only 1 in 1997 (Figure 1).

The funds for the first cochlear implant was fully government sponsored for the patients in KKM while for those in UKM, it was either government or self-sponsored depending on the terms and conditions that applied. Most of the second procedures of the cochlear implants however were self-sponsored (Table 3).

Discussion

Cochlear implants have been around since the 1960s but only became popular during the 1990s [2]. The field of cochlear implants has evolved rapidly since it was first started. The procedure does not restore the patients' normal hearing but rather gives them a useful representation of the sounds in the environment thus making it possible for them to understand speech.

Subsequent years, with significant improvements in hearing technology and surgical skills, bilateral CI have been advocated in most of the advanced countries in view of the good outcomes eg UK and Australia, New Zealand [12-14] . As in the recent Press Release

Table 1: Unilateral Cochlear Implantation and Bilateral Cochlear Implantation.

Unilateral Cochlear Implantation	Bilateral Cochlear Implantation
476 (93.3%)	34 (6.7%)

Table 2: Bilateral Cochlear Implantation.

Bilateral Cochlear Implantation	
Simultaneous	Sequential
3(8.8%)	31 (91.2%)

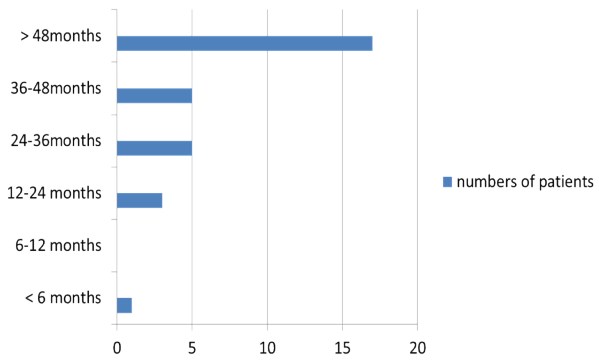

Figure 1: Chart showing the time interval for sequential Bilateral CI.

Table 3: Sources of funding.

SEQUENTIAL	24 GOVERNMENT FUNDING 7 SELF FUNDED	23 SELF FUNDED 8 GOVERNMENT + OTHERS
SIMULTANEOUS	2 GOVERNMENT (BRUNEI) 1 COMPANY (PETRONAS)	

by New Zealand Government, they mentioned that the Budget of 2014 where two funded cochlear implants for children which will be effective in July 2014 [15,16].

The first Cochlear Implant Surgery in Malaysia was done in PPUKM - December 1995. The first bilateral cochlear implantation was done in 2007 via sequential implantation. Although the benefit of bilateral cochlear implantation is proven, there are limited number of patients in Malaysia underwent bilateral CI either simultaneously or sequential.

The cochlear implant is estimated to cost around RM 70,000 to 100,000 in Malaysia depending on the specification needs and manufacturing costs. There is a policy in Malaysia that gives children with profound hearing impairment the privilege of having only one government paid cochlear implant [5].

In Malaysia, bilateral cochlear implantation rate was only 6.7% where as in advanced countries, almost 100% recipients have bilateral cochlear implantation. The status of bilateral cochlear implantation in Malaysia is mainly due to funding issues. In sequential cochlear implantation, the funding of the first cochlear implant to the needy patient is usually by Government and other sources of sponsorship and the subsequent second CI funding were mainly self sponsor. As for the simultaneous setting for bilateral CI, the sources of funding were 100% fully sponsored; in these case study mentioned by Brunei Government and Private Company; Petronas.

The ministry of health in Malaysia has a National Core Committee on Cochlear Implant organization that focuses on matters related to the procedure such as the selection of the patients, training of manpower, provision of equipment and also funding of the procedure [2]. The committee meets at least every three months to discuss the above matters and it consists of a chairman, secretary and elected members.

Conclusion

From the above study it is clear that the number of bilateral cochlear implants were few compared to the unilateral cochlear implantation. There was only about 6.7% of bilateral cochlear implantation done in Malaysia based on the data collected compared to the unilateral (93.3%). Clearly, the main reason being the lack of funding. Bilateral cochlear implant should be strongly pursuing to the government in view Malaysia as one of the developing countries and also with the increasing advancement of the technology.

Declaration

All the data are from patients using Cochlear Nucleus implants. “We understood the policy on declaration of interests and declare that we have no competing interests”.

References

1. World health Organization (2014) Deafness and Hearing Loss.
2. Ministry of Health Malaysia, Medical Development Division (2009) Cochlear implant service operational policy.
3. Lim R (2011) Government may provide free cochlear implants for children of poor families.
4. Zeng FG (2004) Trends in cochlear implants. Trends Amplif 8: 1-34.
5. Health Information Today2012, Role of Cochlear Implant.
6. Dunn CC, Tyler RS, Oakley S, Gantz BJ, Noble W (2008) Comparison of speech recognition and localization performance in bilateral and unilateral cochlear implant users matched on duration of deafness and age at implantation. Ear Hear 29: 352-359.
7. Tyler RS, Parkinson AJ, Wilson BS, Witt S, Preece JP, et al. (2002) Patients utilizing a hearing aid and a cochlear implant: speech perception and localization. Ear Hear 23: 98-105.
8. Gantz BJ, Tyler RS, Rubinstein JT, Wolaver A, Lowder M, et al. (2002) Binaural cochlear implants placed during the same operation. Otol Neurotol 23: 169-180.
9. National Health Service (2013) Hearing loss – Treatment.
10. Müller J, Schön F, Helms J (2002) Speech understanding in quiet and noise in bilateral users of the MED-EL COMBI 40/40+ cochlear implant system. Ear Hear 23: 198-206.
11. Litovsky RY, Parkinson A, Arcaroli J, Peters R, Lake J, et al. (2004) Bilateral cochlear implants in adults and children. Arch Otolaryngol Head Neck Surg 130: 648-655.
12. Balkany T, Hodges A, Telischi F, Hoffman R, Madell J, et al. (2008) William House Cochlear Implant Study Group: position statement on bilateral cochlear implantation. Otol Neurotol 29: 107-108.
13. H E Cullington, D Bele, J C Brinton, M E Lutman (2011) United Kingdom National Paediatric Bilateral Audit. Cochlear Implant International.
14. Georgia Moselen-Sloog (2013) One ear is not enough, advocates say.
15. Scoop Media (2014) Budget 2014: Two funded cochlear implants for children.
16. Berke J (2013) Bilateral cochlear implants.