Integration of Cochlear-Implanted Children into the General Israeli Community

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ABSTRACT: Background: Severe hearing impairment can have devastating effects on social integration and vocational opportunities. Objectives: To investigate how well – or poorly – individuals who underwent cochlear implantation as children integrated into the general Israeli hearing community. Method: We sent a questionnaire to the 30 subjects ≥18 years old who underwent cochlear implants in our department from 1990 to 2004 when they were < 18 years of age and had used their device for at least 3 years before replying. Results: Eighteen implant users responded (14 males), yielding a 60% response rate. Their mean age was 13.3 ± 7.0 years (range 6–17) at implantation and 21.1 ± 3.6 years (range 18–34) when they filled in the questionnaire. Five were attending rabbinical school (yeshiva students), four were in regular military service, five were university students (three also held jobs), two were attending high school, one was employed (and had a university degree), and one had left the yeshiva and was unemployed when he returned the questionnaire. Fourteen respondents use the oral communication mode for conversation and the other 4 use both oral and sign languages. Longer daily implant use was significantly associated with coping with the difficulties in the setting in which they were currently active, with a higher level of satisfaction with their current lifestyle and with recognition of the implant’s contribution to this satisfaction (P = 0.037, P = 0.019 and P = 0.001, respectively). Conclusions: Advances in cochlear implant technologies enable profoundly deaf implanted children to integrate well into the Israeli hearing society, albeit with a large intersubject variability.

KEY WORDS: cochlear implant, children, social integration, outcome, employment

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A hearing disability can negatively affect the quality of social interaction and the self-esteem of hearing-impaired individuals, as well as deleteriously influence their opportunities for training and promotion. They must constantly strive to understand the spoken word, to express themselves verbally, and to speak in a manner that is comprehensible to the hearing public. Verbal communication is an essential element in many occupations, whether in face-to-face conversations, meetings in noisy environments, or on the telephone. Thus, the workplace poses the most difficult communication challenges for many hearing-impaired people.

The main goal of a cochlear implant program is to improve communication possibilities and the quality of life of hearing-impaired individuals by providing them optimal hearing performance. Cochlear device systems can help the profoundly deaf and hard of hearing avoid social isolation and transform them into socially active individuals. Cochlear implant equipment has improved considerably over the last few years. The devices have become more esthetic, convenient for daily use, highly reliable, technologically advanced and, as a result, more widely used. Fazel and Gray [1] found that a cochlear implant is associated with an improved chance of being employed among adult recipients, that it helps them with career prospects, and improves their job satisfaction. Other authors demonstrated the benefits of a cochlear implant in speech perception and production and in language and literary skills, all resulting in positive changes in quality of life and opportunities of employment [2–4]. There are few reports, however, on the long-term social and occupational outcome of patients who received cochlear devices in their childhood [5–7].

Pediatric implantations have been performed in our department since 1990. As the first implanted children are now becoming young adults we chose to focus on the implications of the implant in terms of the subjects’ integration into the hearing community. The need for appropriate counseling prompted this investigation on the social integration of deaf children who grew up with their cochlear implants.

SUBJECTS AND METHODS

A questionnaire that had been developed in our institution was sent to all the patients who were implanted in our department between 1990 and 2004 when they were less than 18 years old and had now reached the age of at least 18. Another criterion was that they had used their device for at least 3
years by the time they filled in the questionnaire. The options for the following three questions were yes/no/not relevant: Does hearing impairment affect the educational setting? Does hearing impairment affect the occupational setting? Does hearing impairment affect the military service setting? The responses to the other questions [Table 1] were scored as follows: 1 = not at all, 2 = very little, 3 = little, 4 = much, 5 = very much.

Statistical analysis was performed using the chi-square and Fisher’s exact tests (in cases where the number of observations in a cell was less than five). The difference was considered significant at a \( P \) value of < 0.05.

RESULTS

Of the 30 implant users who fulfilled the study entry criteria, 18 responded (14 males) to the questionnaire, yielding a response rate of 60%. The mean age of the responders at implantation was 13.3 ± 7.0 years (range 6–17) and 21.1 ± 3.6 years (range 18–34) at the time of completing the questionnaires. Fourteen were congenitally deaf, and some infectious disease was suspected as the cause of deafness in the remaining four. Five responders were attending rabbinical school (yeshiva students), four were in regular military service, five were university students (three were also holding down jobs), two were attending high school, one was employed (he had earned a bachelor’s degree at a university), and one had left the yeshiva and was unemployed at the time that he returned the questionnaire.

All the respondents used their devices for at least 7 hours a day (mean 15.7 ± 4.9 hours, range 7–24). One soldier, one yeshiva student and one university student used their devices uninterruptedly for 24 hours each day. Fourteen patients used the device for exclusively oral conversation, while the other 4 used both oral and sign languages. Seven responders (three yeshiva students, one soldier, one non-employed university student, one employed university student and one employed implant user) believed that hearing impairment affects the educational setting. Five implant users (two soldiers, one yeshiva student, one employed university student and one unemployed responder) believed that hearing impairment affects the occupational setting. Only three respondents (one yeshiva student, one university student and one unemployed implant user) think that hearing impairment affects the military service setting. However, the implanted soldiers reported that they managed quite well with their hearing disability during their military service. On one end of the scale, 10 responders (55.6%) were very satisfied (a score of 5) with their current lifestyle, while at the other end, one soldier and one employed university student reported that their being implanted caused the problems they were currently having.

Figure 1 demonstrates the distribution of the number of respondents and their answers to the items in the questionnaire. The longer use of the implant during the day was significantly associated with better coping with the difficulties in question 1, and a higher level of satisfaction with the current lifestyle (question 5) and with the appreciation of the implant’s contribution to this level of satisfaction (question 6) \((P = 0.037, P = 0.019\) and \(P = 0.001\), respectively).

DISCUSSION

We conducted a questionnaire survey to investigate how well – or poorly – profoundly hard-of-hearing implanted children integrated into the hearing Israeli society when they grew up. Their responses were highly encouraging. For convenience, we divided the highly heterogenic group of responders into yeshiva students, soldiers, high school and college students, and employed individuals. Figure 2 depicts the distribution of mean scores of their answers to the items in the questionnaire [Table 1]; the differences between the groups were insignificant.
This is a descriptive study, not a comparative one. As such, the element of bias within a study based on a mailed-in questionnaire is unavoidable and this should be taken into consideration. Cochlear implant users who are happy with their devices are probably more likely to return the questionnaires. There was no control group: individuals with a hearing loss that is successfully managed with conventional hearing aids cannot be used as controls for implanted individuals whose hearing impairment ranges from very severe to profound. Moreover, non-implanted individuals with hearing levels comparable to those of implant users also cannot be used as controls since they use mainly sign language and their social contact is characteristically within the deaf community.

Our results on education and employment of implant users are comparable with those reported by others [5-7]. Conscription to military service is, however, compulsory in Israel, but most deaf individuals can only volunteer for certain administrative duties. It was especially gratifying that 4 of our 18 responders were found fit to serve in the Israel Defense Forces.

It should be noted that our study patients were implanted relatively late. Since the current age at implantation has been reduced by up to 12 months, recently implanted children can benefit from both advanced implant technology as well as from early implantation. We hope that these advantages will positively influence their educational achievements, their employment opportunities and their place in a hearing society.

**CONCLUSIONS**

The results of the present study suggest that profoundly deaf implanted children are able to integrate in the social system, albeit with a large inter-subject variability. Advances in cochlear implant technologies have enabled implanted persons to achieve satisfaction with their educational, career and social opportunities. We are optimistic that earlier age at implantation and advances in implant technology will ensure an even brighter future for profoundly hard-of-hearing members of society.

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**Figure 2.** The distribution of the mean scores of answers to the Table 1 questions for each group of patients. Group 1 = yeshiva students, group 2 = soldiers, group 3 = students, group 4 = employed responders.

**References**


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“...the animal shall not be measured by man. In a world older and more complete than ours, they move finished and complete, gifted with extension of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren; they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendor and travail of the earth”

Henry Beston (1888-1968), American naturalist and author