

Psychological Effects of Acquired Hearing Loss in Late Childhood

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Abstract

This study included 90 children, age ranging from 6-12 years with varying degrees of acquired conductive, sensorineural or mixed hearing loss, besides 50 healthy children as a control group of nearly the same age and sex distribution. The duration of hearing loss was ranging from 1-5 years. Otolaryngologic, audiological and general evaluation were done for all children. Non-verbal IQ-test, semistructured psychiatric interview and specific psychological tests used in Ain Shams Psychiatric Center were done for all children to detect anxiety, phobias or depression.

There was no significant difference in the IQ- test between children of both groups. Anxiety, phobia and depression were more significant among cases with hearing loss than the controls and increased with the severity of hearing loss. Anxiety was the most prevalent psychiatric morbidity' among the cases. The prevalence of anxiety and phobias decreased whereas that of depression increased as the duration of hearing loss increased.

Introduction

Hearing is the primary sensory modality for acquisition of speech and language, providing a fundamental basis for social adjustment and normal psychological development.

Even mild or unilateral hearing loss during childhood has been shown to have a negative impact on language, hearing and child behavior.

More severe hearing loss presents major handicap for normal psychological development (Northern and Downs, 1984).

The most obvious handicap which the hearing impaired suffers is in communication but Ramsdell, 1970, argued that the deprivation of background noises was most intimately related to the feelings of depression to which the hearing impaired were prone.

This was produced by the feeling of de-

tachment, unreality and isolation that this deprivation produce. The hearing impaired-child lives in a social world that is perceived as being somewhat apart. This permanent handicap limits the activity and development potential of children (Lobato, 1983).

Adverse emotional consequences are likely to be a continuum to hearing loss rather than discrete illnesses or state

Mahapatra (1974) has also postulated that emotional consequences of hearing impairment are the result of sensory deprivation and social isolation.

Hearing disabilities, due to their interactive nature strongly affect intimate relationships that leads to social isolation and emotional impact (Hetu et al, 1993). The more profound the impairment and the earlier onset the greater the effect (Hindley and Brown, 1994).

Materials and Methods

This study included 90 children with varying degrees of acquired hearing loss, of duration more than 1 year. Besides 50 apparently normal control children of nearly the same age, sex, social level and family construction.

The type of hearing loss in these children was conductive in 58, sensorineural in 9 and mixed hearing loss in 23 patients. The cause of hearing loss in these children was: Chronic suppurative otitis media in 47, chronic secretory otitis media in 36, post meningitis in 3, post measles in 2 and viral labyrinthitis in 2.

Full general and otorhinolaryngologic examination were done for all the children of both groups (Hearing impaired children and control group) to exclude any other associated general medical or otorhinolaryngologic disease.

Full audiologic evaluation was done for all the children of both groups; including:

- a. Pure tone audiometry.
- b. Speech audiometry.
- c. Tympanometry.
- d. Evoked response audiometry (in certain cases)

According to the Audiometry results, the children with hearing loss were divided into three groups:

- 1-Mild hearing loss (Less than 30 dB).
- 2-Moderate hearing loss (From 30-60 dB).
- 3-Severe hearing loss (From 60-90dB).

The duration of hearing loss was more than 6 month, ranging from 1 year-5

years. Full psychiatric evaluation was done for all children of both groups to detect anxiety, phobia and depression using semistructured psychiatric interview used in Ain Shams Psychiatric Department.

Non-verbal IQ test was applied for all children of both group (Draw-a-man test).

The specific psychological tests used in Ain Shams psychiatric center were also applied to all of these children of both groups namely:

- 1-Children's Anxiety Scale.
- 2-Children's Phobia Scale.
- 3-Children's Depression Inventory.

Statistical analysis of the whole work was done at the department of Community medicine, Ain Shams University using IBM computer.

Results

The age range in cases with hearing loss and the controls varied from 6-12 years with a mean value of 9.32 $\pm$ 1.24 years in diseased children and 9.7 $\pm$ 1.72 in the controls.

Psychometry for children with severe hearing loss could not be completed because of inability of these severely disabled children to complete this self-assessment investigation.

The non-verbal IQ-test (Draw-a-man test) was not statistically significant in both groups.

The result of both the psychiatric and psychologic evaluation of both groups are shown in the following tables (1-7) and figures (1-10).

Relationship between the prevalence of phobias and the duration of hearing loss shows that as the duration of hearing loss increases, prevalence of phobias decreases.

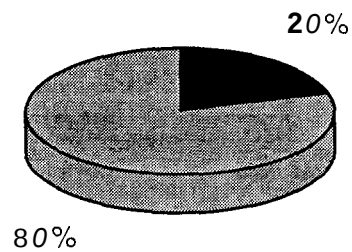
Table (1)
Clinically diagnosed anxiety

	-	+	t-test
Mild H.L.	30 83.3%	6 16.7%	$p>0.05$ not significant
Moderate H.L.	34 79.1%	9 20.9%	$p<0.05$ significant
Sevre H.L.	8 72.7%	3 27.3%	$P<0.05$ significant
Total H.L.	72 80%	18 20%	$P<0.05$ significant
Controls	47 94%	3 6%	

Clinically diagnosed anxiety is more significant among cases with hearing loss than controls and shows gradual increase with severity of hearing loss.

Fig. 1:

20% Anxiety - 80% H.L.



6% Anxiety -94% Control

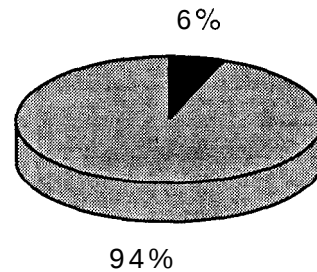


Table (2)
Clinically diagnosed phobia.

	-	+	t-test
Mild H.L.	33 91.7%	3 8.3%	$p>0.05$ not significant
Moderate H.L.	39 90.7%	4 9.3%	$p>0.05$ not significant
Sevre H.L.	6 54.5%	5 45.5%	$P<0.01$ Highly significant
Total H.L.	78 86.7%	12 13.3%	$P<0.05$ significant
Controls	46 92%	4 8%	

Clinically diagnosed phobias are more significant among cases with severe hearing loss than the controls and shows gradual increase with severity of hearing loss.

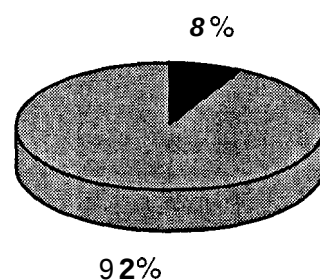
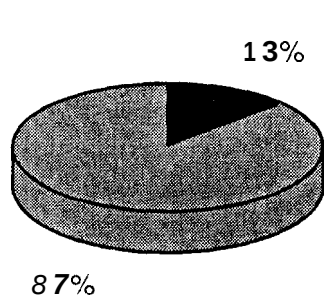
Fig. (2)**13.3% Phobias - 86.7% H.L.****8% Phobias - 92% Control**

Table (3)
Clinically diagnosed depression

	-	+	t-test
Mild H.L.	34 49.4%	2 5.6%	$p > 0.05$ not significant
Moderate H.L.	36 83.7%	7 16.3%	$p > 0.05$ significant
Sevre H.L.	6 54.5%	5 45.5%	$P < 0.01$ Highly significant
Total H.L.	76 84.4%	14 15.6%	$P < 0.05$ significant
Controls	48 96%	2 4%	

Clinically diagnosed depression is more significant among cases with moderate and severe hearing loss than controls and shows gradual increase with the severity of hearing loss.

Fig. (3)

15.6% Depression - 84.4% H.L.

4% Depression - 96% Control

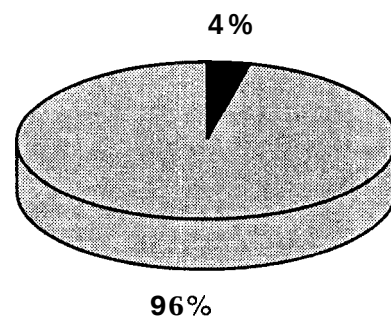
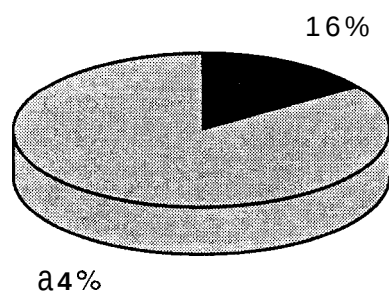


Table (4)
Psychometric scores in anxiety

	Number of case:	Mean	S.D.	t-test
Mild H.L.	36	10.9	5.3	P<0.001 Highly significant
Moderate	43	11.8	6.8	P<0.001 Highly significant
Controls	50	7.1	3.4	

Psychometric scores for anxiety were highly significant in mild and moderate hearing loss than in the controls.

Fig. (4)
Psychometric scores in anxiety

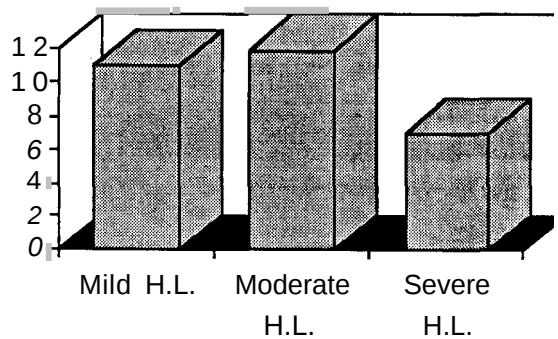


Table (5)
Psychometric scores in phobia .

	Number of cases	Mean	S.D.	t-test
Mild H.L.	36	6.22	2.81	P>0.05 not significant
Moderate H.L.	43	7.92	3.17	P<0.001 Highly significant
Controls	50	5.12	2.73	

Psychometric scores for phobia were highly significant in moderate hearing loss than the controls.

Fig. (5)
Psychometric scores in phobia .

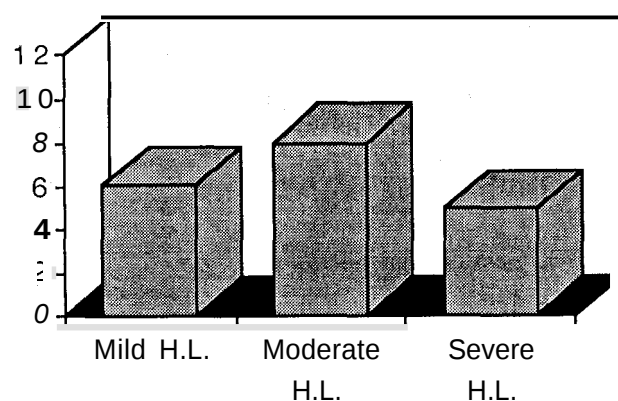
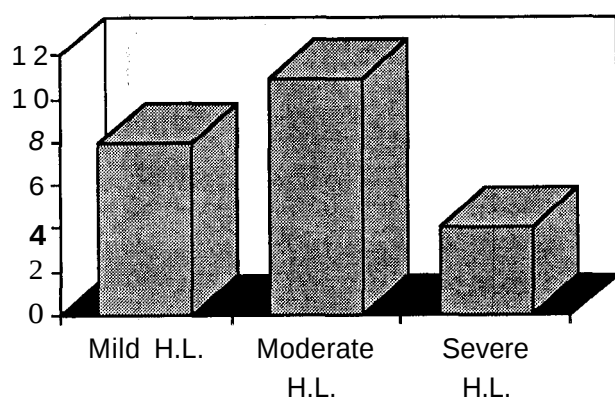


Table (6)
Psychometric scores in depression

	Number of cases	Mean	S.D.	t-test
Mild H.L.	36	8.13	4.92	P<0.01 significant
Moderate H.L.	43	11.43	7.22	P<0.001 Highly significant
Controls	50	4.26	3.19	

Depressive scores were highly sig. in mild and moderate hearing loss than controls.

Fig. (6)
Psychometric scores in depression



The relationship between the duration of hearing loss and prevalence of psychiatric disorders is demonstrated in the following table (7) and figures (6,7,9,10).

Table (7)
Duration of hearing loss (varies from 1 to 5)

Cases	Mean	S.D.±	Min.	Max.
Mild H.L.	2.15	0.75	1.00	3.50
Moderate H.L.	2.76	1.32	1.00	5.00
Severe H.L.	3.43	0.85	2.50	5.00
Total H.L.	2.58	0.88	1.00	5.00

Fig. (7)
Duration of hearing loss (in years).

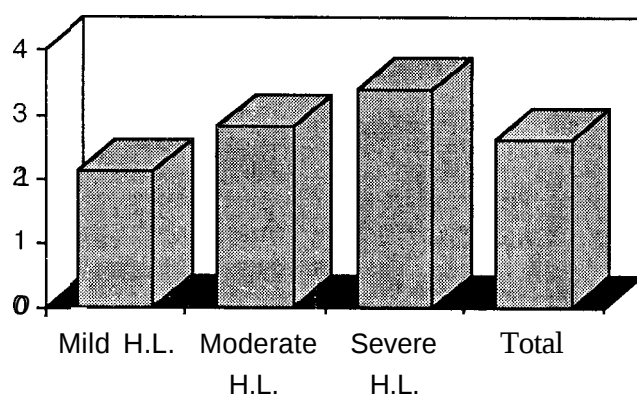
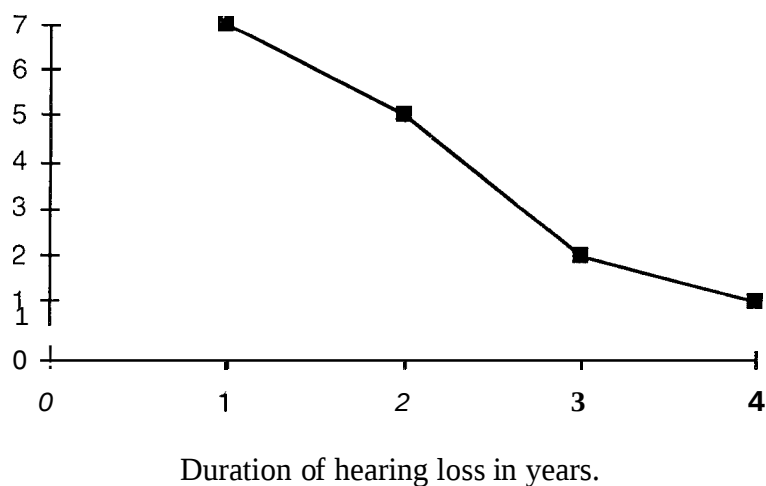


Fig. (8)
Number of patients of hearing loss with anxiety.



As the duration of hearing loss increases prevalence of anxiety decreases. The solid curve in figure (8) represents the best fit of data obtained using the following equation:

$$\text{Log}(Y) = B * \text{Log}(X) + A$$

Where:

$$A = 1.9$$

$$B = 1.7$$

X=duration of hearing loss in years

Y=number of patients with hearing loss with anxiety

Fig. (9)
Number of patients of hearing loss with phobias.

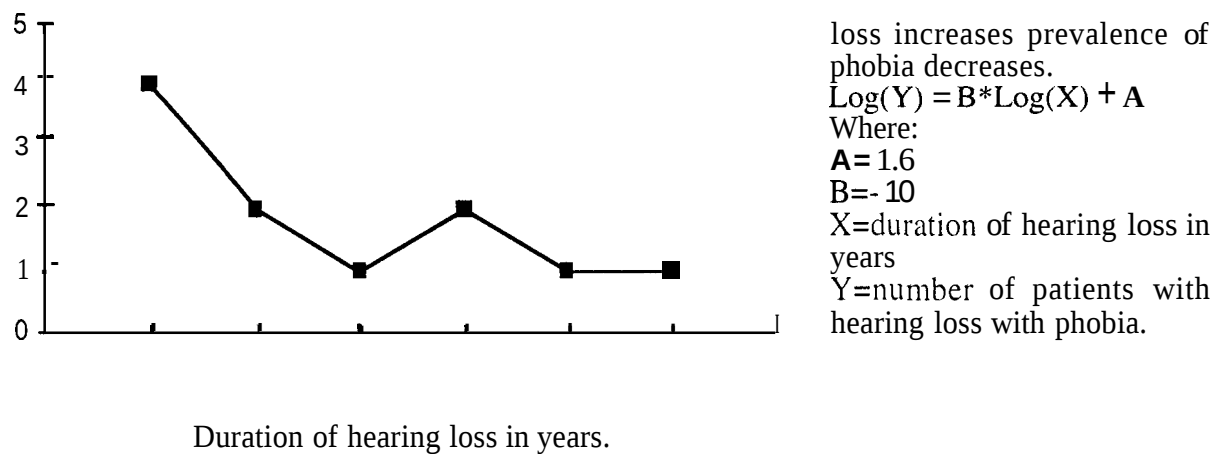
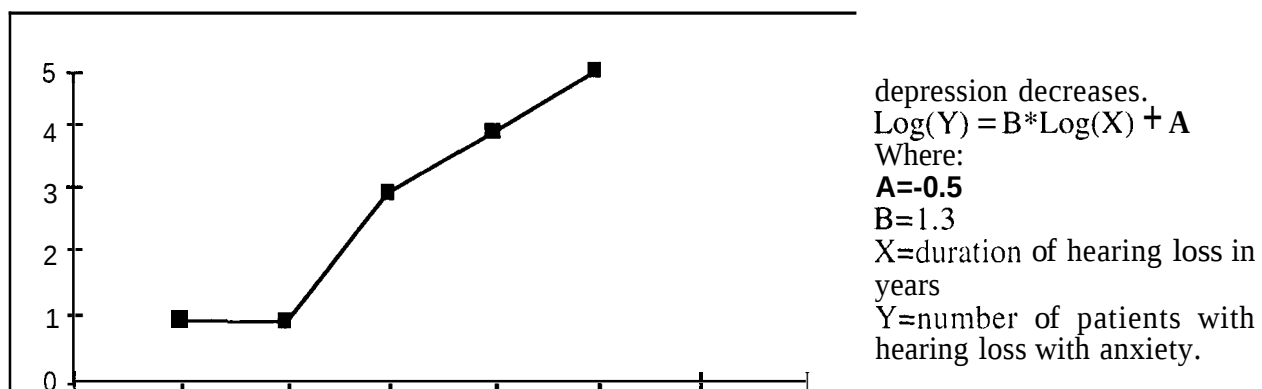


Fig. (10)
Number of patients of hearing loss with depression.



Discussion

In the early 1950s, the Conjunction of developments in political, social and scientific spheres created the necessary condition to attract widespread attention to sensory deprivation research (Okasha, 1987).

Hearing loss is considered one of the

most common and important forms of sensory deprivation (Mc Entee, 1995).

Bamford and Saunders. 1991, reported that male children aged 6-11 years were found to be somewhat over represented in hearing impairment group in comparison to their proportion in general population, till corresponds to the age group included in the present study. The most

common cause of acquired hearing loss in late childhood is C.S.O.M. (Kenna et al, 1986), this goes with the results of this study in which C.S.O.M. represent the cause of hearing loss in more than 50% of the cases. Otitis media with effusion was the second frequent cause of hearing loss in our study group representing 40% of the cases. Otitis media with effusions is now thought to have a significant effect on language development (Haggard and Hughes, 1991).

Meningitis is still one of the serious infections that may affect the auditory and vestibular parts of the inner ear causing sensorineural hearing loss which varies from mild losses to total deafness (Aust, 1994). Three cases with history of meningitis followed by severe hearing loss were recorded in the current work.

Several authors have studied psychiatric morbidity in relation to hearing impairment among children and adolescents. Rutter et al. (1970) showed a 15.4% prevalence of psychiatric morbidity in his series of moderate to profound hearing loss. Fundulis et al. (1979) reported a 54% prevalence of total psychiatric morbidity in cases with profound hearing loss, and a 28% prevalence in cases of hard of hearing among a series of school population. However, Aplin, (1987) have shown a 16.6% psychiatric morbidity in a sample with wide age range of children and adolescents with wide range of hearing loss mild to profound. Hindley et al. (1994) have reported a 50.3% prevalence of psychiatric morbidity in large series of hearing impaired children ranging from moderate to profound using a highly structured diagnostic interview, they used also parent's checklist (PCL) and teachers checklist (TCL).

In the current study on children with mild to severe hearing loss the prevalence of anxiety, phobia and depression was 35% which is 2.6 times that of the control. In

the present study, severity of hearing loss was correlated to psychiatric morbidity, especially to phobia and depression. This goes with the results of Jones et al. (1984), which revealed that probability of emotional disturbances did increase with increasing severity of hearing difficulties. On the other hand Schlesinger and Meadow (1972), and Freeman et al. (1975) studies. The severity did not seem to correlate with psychiatric disorders.

Abdel Baky et al. (1988), found that the prevalence of anxiety disorders among normal primary school children was 3.9% and Sayed et al. (1994) reported 7.9% prevalence of anxiety disorders among primary school children. In the current study anxiety disorders among hearing impaired group was 20% opposite to 6% recorded in the control group. It was the most prevalent disorders among hearing impaired children in the study. This goes with Hindley et al. (1994).

King and Stephens (1992) revealed in their work that even patients who have auditory disability with normal hearing have a tendency to anxiety and depression. In the present study children with severe and moderate hearing loss showed more prevalence of anxiety disorders; 27.3% and 20.9% respectively, while mild hearing loss showed 16.7% prevalence of anxiety disorders. Psychometric scores using the child anxiety scale were also highly significant in mild and moderate hearing loss in whom the test was reliable.

In the current work, depression was assessed in both control and study groups to be 4% and 5.6% respectively. Gilhome et al. (1980) showed that a significant relationship between depression and hearing impairment as they record 41% prevalence of depression among hearing impaired group of moderate to severe hearing loss. In the present study depression was significant in severe and moder-

ate hearing impaired group being 45.5% and 16.3% respectively.

Phobia have been postulated to occur more in sensory deprived children. in the present study phobia was diagnosed in 13.3% in hearing impaired group and 6.7% in the control group, which goes with the results of Dupont, (1983), who reported 5% occurrence of phobia in all pediatric patients.

Only severe hearing impaired group showed significant phobia disorders 45.5% A predominance of dark phobia in our study was noticed. School phobic was also recorded in milder degrees of hearing loss.

In the current study depression was found to be directly proportional to duration of hearing loss, this goes with the results of Silverman and Davis (1970). Anxiety and phobia in our study seems to be inversely proportional to the duration of the hearing loss, although phobia has a more persistent nature than anxiety disorders; this can be explained by the adaptation of the hearing impaired child to his handicap.

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التأثير النفسي لفقدان السمع في الطفولة المتأخرة

تضمنت هذه الدراسة ٩٠ طفلاً تتراوح أعمارهم ما بين ٦ و ١٢ سنة يعانون من درجات متفاوتة من فقدان السمع التوصيلي أو الحس عصبي أو المزدوج ، إضافة الي ٥٠ طفل صحيح من اعمار متقاربة وبتوزيع متناسب في الجنس كانوا بمثابة مجموعة ضابطة. وقد تراوحت فترة فقدان السمع ما بين سنة وخمس سنوات وقد تم فحص جميع الاطفال بواسطة الكشف علي الاذن والحلق إضافة الي قياس السمع والكشف العام واستخدمت اختبارات الذكاء غير اللفظية والمقابلة النفسية شبه المقننة وبعض الاختبارات النفسية المستخدمة في مركز الطب النفسي بجامعة عين شمس لاكتشاف اي اضطرابات قلق او مخاوف او اكتئاب. وقد اشارت النتائج الي عدم وجود علاقة ذات دلالة احصائية بين معدلات الذكاء في المجموعتين في حين كان القلق والمخاوف والاكتئاب اعلي بمعدل دال احصائيا بين الاطفال الذين يعانون من فقدان السمع . كان اضطراب القلق اكثر الاضطرابات النفسية شيوعا بين المرضى من الاطفال.. كما اشارت النتائج الي ان معدلات القلق والمخاوف تقل في حين يرتفع معدل الاكتئاب مع طول مدة فقدان السمع.

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