

Office-based research: What is the incidence of mumps related hearing loss?

Hiromi Hashimoto, Masashi Fujioka, Hiroshi Kinumaki. Kinki Ambulatory Pediatrics Study Group, Osaka, Japan.

Abstract

1. The purpose of this study is to determine the incidence of mumps related hearing loss.

- The incidence of mumps related hearing loss was considered 1 / 15,000-1 / 20,000 cases, but recent reports suggest that the incidence might be higher.
- We prospectively investigated the hearing ability of the children with mumps.
- The survey was conducted by 40 pediatric outpatient clinics of which the doctors, mainly pediatric practitioners, were the members of Kinki Ambulatory Pediatrics Study Group (KAPSG).
- In Japan, children are not routinely immunized against mumps (only MR vaccine is used).

2. The result indicates that mumps related hearing loss occurred in 7 of 7,403 patients (= 1 / 1,000).

- It should be all the more important to enlighten the public and health professionals about the risk of mumps related hearing loss and the need for vaccination.

Background

- "Unilateral, rarely bilateral, nerve deafness may occur; although the incidence is low (1 / 15,000 cases)", Nelson(2004), 17th Edition
- Recent reports in Japan show 1 / 100-300 cases.

Table 1 past and recent reports of mumps related hearing loss

Author	Incidence	Investigation methods
Everberg (1957)	1 / 20,000 *1	survey for 10 years in Copenhagen
Aoyagi (1996)	5 / 1,470 (0.34%) *2	survey of an area (Naka county, Wakayama Pref.) for 1 year
Ishimaru (1988)	3 / 551 (0.54%)	3 year experience at an office

Calculation methods of the incidence of mumps related hearing loss

*1 Everberg (1957)

the detected number of patients with mumps related hearing loss
 supposed number of mumps patients of the area (= half of the population)
 = 5 / 92,500 = 1 / 20,000 mumps patients

*2 A retrospective study by Aoyagi (1996)

the detected number of patients with mumps related hearing loss
 the number diagnosed as mumps in participating medical institutions
 = 5 / 1,470 = 1 / 300 mumps patients

Subject and Methods

Subject:

- All patients under 20 years old who consulted a doctor in our group from January 2004 to December 2006 and was given diagnosis of mumps.
- The diagnostic criteria for mumps (both 1 and 2 must be present):
 - sudden onset of salivary gland swellings that continue for more than 2 days
 - no other probably causes of salivary gland swelling

Investigation methods:

In 40 pediatric outpatient clinics (38 private clinics and 2 hospitals)
 From Jan. 2004 to Dec. 2006

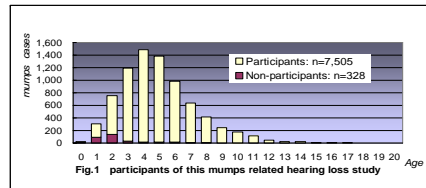
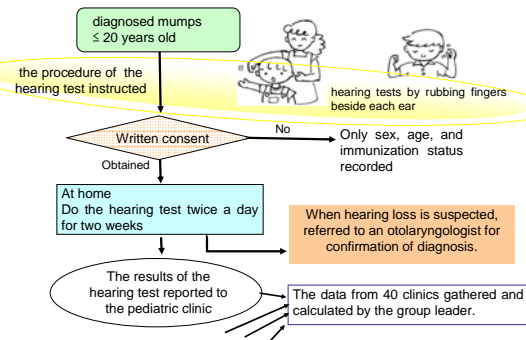


Fig.1 participants of this mumps related hearing loss study

Results

- All the mumps cases ≤ 20 years old from Jan. 2004 to Dec. 2006 were 7,833, of which 7,505 cases (male: 4,058 and female: 3,447) were eligible for this study. (Fig1)
- In 7,403 cases, we were able to perform hearing ability assessment after the mumps onset.
- Seven cases were diagnosed with new onset hearing loss (diagnosed as mumps related hearing loss). (table2, Fig2)
- The incidence is $7 / 7,403 = 1 / 1,000$
 - In these 7 cases, none had been previously vaccinated against mumps virus.
 - Hearing loss was severe and did not resolve for any cases.
 - No cases of mild hearing loss were found.
- We were not able to follow 102 cases.

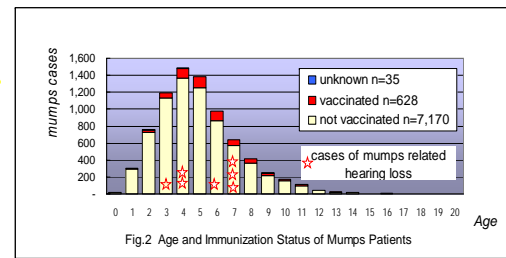


Fig.2 Age and Immunization Status of Mumps Patients

Table2 patients with mumps related hearing loss found in our survey

No	Age	Sex	Hearing loss Onset (noticed)	affected side	IgM (EIA)	vertigo	prognosis
1	7y1m	M	day 3	L	8	-	Lt total deafness
2	6y7m	F	day 1	R	11.2	-	Rt total deafness
3	3y8m	M	day 5	L	+	day5	Lt ABR no response
4	7y5m	M	day 3	L	12.99	-	Lt total deafness
5	4y10m	F	day 36	L	+	-	Lt total deafness
6	4y7m	M	day 1	R	+	-	50-70dB
7	7y1m	M	day 4	L	12.6	+	Lt total deafness

Discussion

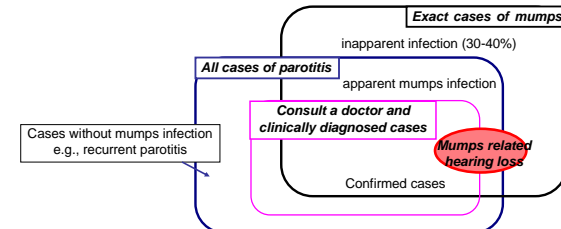
The exact incidence of mumps related hearing loss is difficult to confirm. Because:

1 The accurate number of mumps cases is uncertain.

- Inapparent infection is not rare (30 - 40%)
- Mumps is usually mild. →Some patients do not consult a doctor
- Many other diseases cause parotid swellings.

2 The accurate number of mumps related hearing loss is uncertain, too.

- Unilateral hearing loss is rarely noticed at the onset.
- Most of patients with hearing problems consult an otolaryngologist but not a pediatrician.
- Many patients with mumps related hearing loss tend to consult many doctors due to lack of the effective treatment.



Our calculation methods of the incidence of mumps related hearing loss

the number of patients with mumps and new onset hearing loss in our study
 the number of patients with mumps investigated in our study
 = 7 / 7,403 = 1 / 1,000

Conclusions

- The incidence of hearing loss in children due to mumps is higher than has been previously considered.
- The danger of mumps related hearing loss is not well known in public. This ignorance, together with other reasons, leads to the low rate of mumps vaccination in Japan.

References

- Everberg. Acta Otolaryngol 48, 397,1957
- Aoyagi et al. Shonika 37,1273,1996 in Japanese
- Ishimaru et al. Shonika Shinryo 51, 1421, 1988 in Japanese