

Supplemental material for Analysis of a Cochlear Implant Database: Changes in Tinnitus Prevalence and Distress After Cochlear Implantation

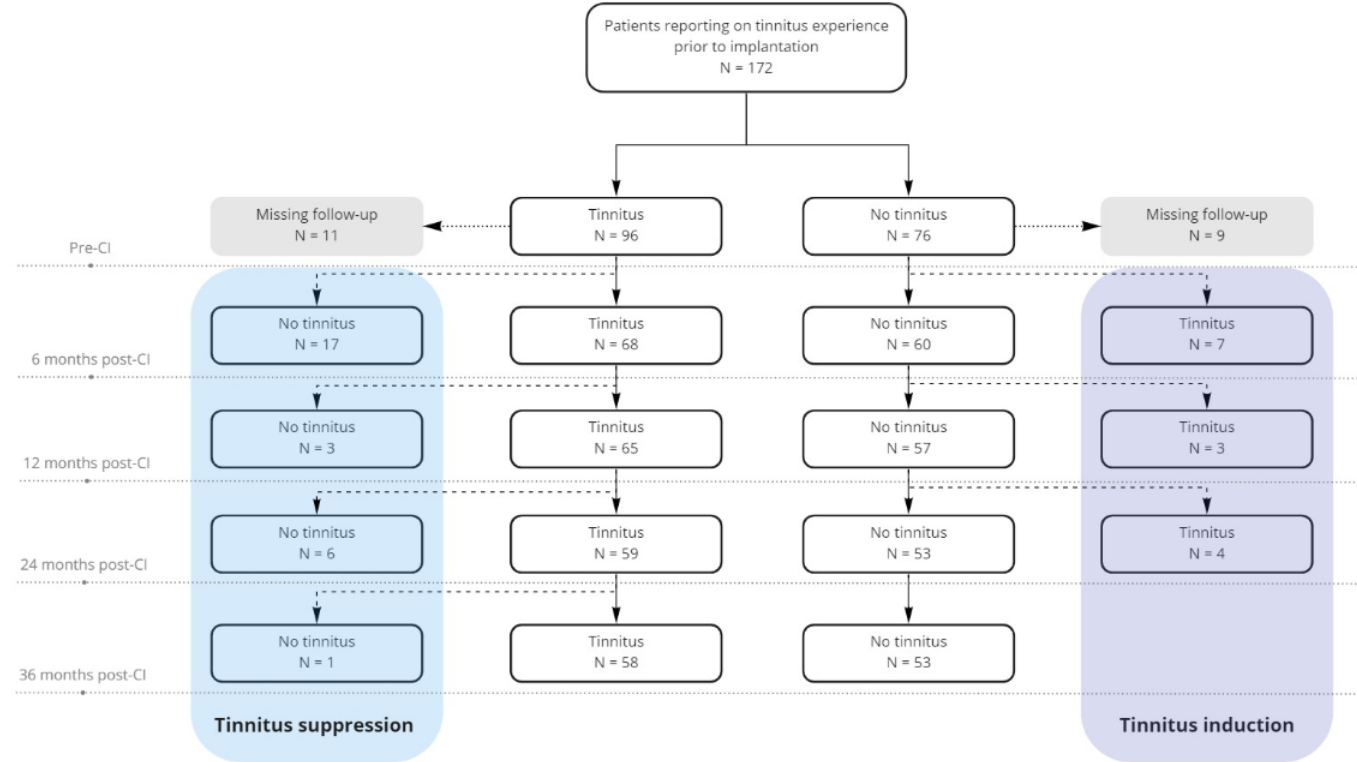


Figure S1. Distribution of tinnitus reporting pre-implantation and at 6, 12, 24 and 36 months post-implantation. CI: cochlear implantation; N: number of patients.

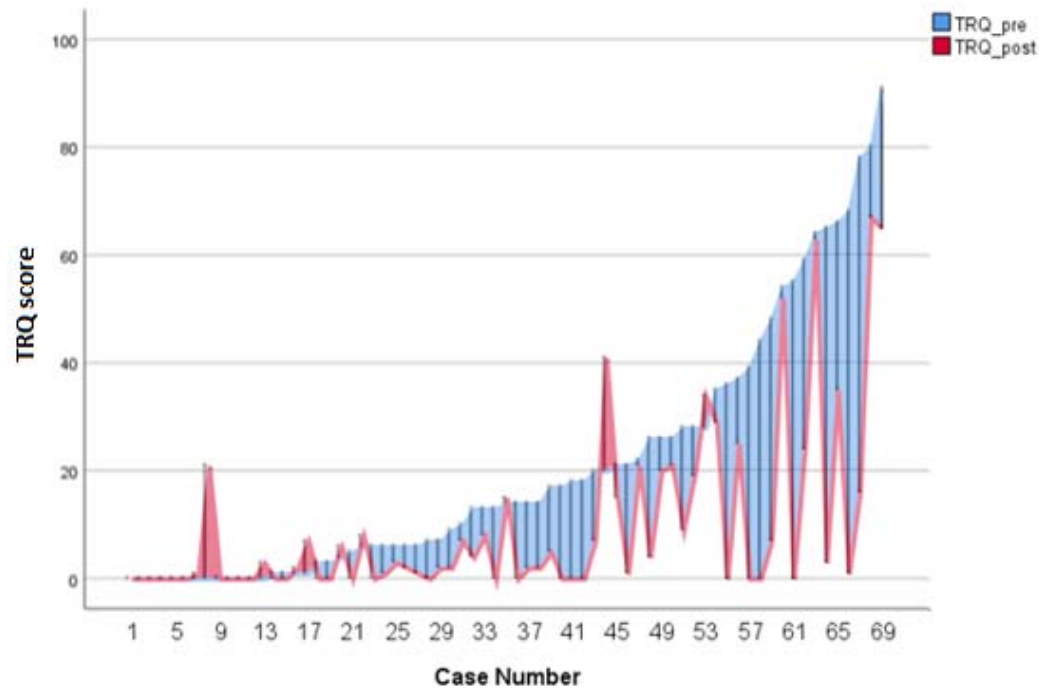


Figure S2. Pre- and post-implantation TRQ score of 68 patients who reported tinnitus pre- and post-implantation. Case number corresponds to individual ranged from 1 to 68.

The area in blue corresponds to a decrease in TRQ scores between pre- and post-implantation and the area in red corresponds to an increase in TRQ score between pre- and post-implantation.

Table S1. Cohort APHAB and CNC outcomes pre-implantation and at 6, 12, 24 and 36 months post-implantation.

Outcomes	Ears (n = 567)
Abbreviated Profile of Hearing Aid Benefit (APHAB), median (IQR)	
Pre-implantation	60.6 (48.2-70.4)
Missing, n (%)	178 (31.4)
6 months post-implantation	38.2 (25.9-51.5)
Missing, n (%)	279 (49.2)
12 months post-implantation	35.6 (26.0-49.3)
Missing, n (%)	355 (62.6)
24 months post-implantation	35.4 (24.1-48.2)
Missing, n (%)	305 (53.8)
36 months post-implantation	36.8 (24.9-49.4)
Missing, n (%)	395 (69.7)
CNC word score, median (IQR)	
Pre-implantation	4.0 (0.0-16.0)
Missing, n (%)	167 (29.5)
6 months post-implantation	36.0 (20.0-53.5)
Missing, n (%)	171 (30.2)
12 months post-implantation	40.0 (25.0-60.0)
Missing, n (%)	289 (51.0)
24 months post-implantation	45.0 (32.0-60.0)
Missing, n (%)	261 (46.0)
36 months post-implantation	48.0 (35.0-60.0)
Missing, n (%)	374 (66.0)

Table S2. Distribution of characteristics and scores between tinnitus and no tinnitus reported post-implantation.

Characteristic	No tinnitus post-CI	Tinnitus post-CI	p-value
Total ears (355), n (%)	203 (57.2)	152 (42.8)	
<i>CNC word, median (IQR)</i>			
Pre-implantation (274)	5.0 (0.0 to 15.0)	4.0 (0.0 to 16.0)	0.56
6 months post (280)	35.0 (16.0 to 50.5)	32.5 (20.0 to 52.8)	0.79
12 months post (191)	40.0 (24.0 to 60.0)	35.0 (21.0 to 55.0)	0.39
Post-implantation (318)	42.0 (25.0 to 60.0)	40.0 (23.0 to 52.8)	0.17
<i>APHAB, median (IQR)</i>			
Pre-implantation (255)	57.4 (47.7 to 67.6)	62.7 (47.4 to 73.5)	0.17
6 months post (240)	38.5 (24.2 to 50.9)	39.8 (29.8 to 53.3)	0.14
12 months post (181)	36.4 (26.8 to 49.8)	34.9 (27.4 to 45.6)	0.59
Post-implantation (350)	37.3 (23.5 to 51.5)	38.5 (25.2 to 49.3)	0.58
<i>Ease of Communication (EC)</i>			
Pre-implantation (255)	54.0 (30.5 to 74.8)	54.1 (31.2 to 81.0)	0.62
6 months post (239)	22.8 (12.0 to 37.5)	25.8 (16.3 to 38.9)	0.37
12 months post (181)	24.6 (14.2 to 29.3)	18.5 (12.0 to 27.0)	0.03*
Post-implantation (350)	20.7 (12.0 to 37.4)	20.5 (12.3 to 33.2)	0.96
<i>Background Noise (BN)</i>			
Pre-implantation (255)	74.5 (57.7 to 84.8)	77.8 (64.3 to 91.0)	0.05
6 months post (240)	54.0 (29.7 to 67.8)	55.2 (41.5 to 72.2)	0.07
12 months post (181)	49.8 (37.5 to 64.3)	52.0 (37.5 to 62.3)	0.77
Post-implantation (350)	49.7 (29.0 to 64.5)	54.2 (39.5 to 64.5)	0.11
<i>Reverberation (RV)</i>			
Pre-implantation (254)	76.7 (58.3 to 93.0)	76.7 (61.2 to 93.0)	0.71
6 months post (239)	50.0 (33.3 to 72.5)	50.0 (37.5 to 71.3)	0.78
12 months post (181)	50.8 (31.7 to 71.9)	49.7 (39.3 to 62.5)	0.50
Post-implantation (348)	50.0 (28.5 to 70.7)	46.8 (33.3 to 70.0)	0.63
<i>Aversiveness (AV)</i>			
Pre-implantation (255)	21.0 (10.2 to 42.6)	29.4 (11.9 to 50.5)	0.15
6 months post (239)	17.2 (8.7 to 35.2)	22.8 (11.2 to 45.9)	<0.05*
12 months post (181)	20.8 (8.8 to 35.5)	22.8 (9.6 to 40.1)	0.46
Post-implantation (350)	18.7 (8.7 to 37.2)	21.0 (7.6 to 39.5)	0.54

APHAB: Abbreviated Profile of Hearing Aid Benefit; CI: cochlear implantation; CNC: consonant nucleus consonant; IQR: interquartile range; n: number of patients; PTA: pure tone average.

* indicates variables that showed a significant difference between the groups (p<0.05)

Table S3. Distribution of APHAB total and subscales scores between tinnitus changes groups.

Tinnitus changes	Induction	No change	No tinnitus	Reduction	Suppression	Worsening
Total ear (176), n (%)	16 (9.1)	49 (27.8)	63 (35.8)	15 (8.5)	31 (17.6)	2 (1.1)
<i>APHAB, median (IQR)</i>						
Pre-implantation (163)	72.0 (55.1-78.6)	55.2 (45.0-69.6)	60.7 (49.1-71.9)	65.8 (53.0-69.3)	54.1 (46.7-62.7)	49.2 (48.6-49.9)
6 months post (154)	45.3 (36.7-57.9)	36.0 (27.6-48.2)	40.8 (25.9-51.1)	49.2 (31.8-55.8)	38.0 (23.3-52.6)	53.3 (50.4-56.2)
12 months post (118)	44.1 (40.4-55.0)	33.2 (26.3-45.2)	34.5 (29.0-47.1)	41.6 (31.0-49.8)	36.4 (23.9-43.8)	45.3 (45.3-45.3)
Post-implantation (176)	39.4 (30.0-57.2)	35.5 (24.7-45.1)	36.9 (25.9-48.5)	42.6 (31.5-59.5)	34.9 (20.7-38.8)	46.4 (45.9-47.0)
<i>Ease of communication (EC)</i>						
Pre-implantation (163)	72.7 (41.1-86.0)	53.0 (30.5-77.4)	57.2 (33.2-78.3)	50.2 (33.0-72.8)	52.1 (29.0-69.7)	44.8 (38.2-51.5)
6 months post (154)	33.3 (20.6-38.5)	22.8 (16.3-33.3)	22.8 (12.8-39.0)	27.0 (11.6-35.3)	29.2 (11.2-41.7)	41.2 (38.0-44.4)
12 months post (118)	22.4 (18.5-27.4)	20.6 (12.3-30.3)	22.7 (14.4-33.3)	18.5 (12.3-29.0)	18.5 (12.0-27.5)	37.2 (37.2-37.2)
Post-implantation (176)	17.6 (10.8-38.4)	22.5 (14.2-33.2)	18.7 (13.5-39.5)	27.0 (14.2-36.5)	16.3 (12.0-24.9)	36.0 (35.4-36.6)
<i>Background Noise (BN)</i>						
Pre-implantation (163)	88.0 (71.1-93.5)	74.7 (59.5-86.9)	78.7 (66.2-86.4)	87.0 (74.5-93.0)	71.5 (58.2-80.8)	80.8 (76.8-84.9)
6 months post (154)	64.5 (39.6-70.5)	54.2 (40.0-64.5)	56.2 (41.8-72.0)	56.2 (42.7-75.7)	45.7 (29.2-67.0)	74.7 (67.5-81.8)
12 months post (118)	54.0 (45.8-70.5)	51.0 (34.7-62.3)	49.8 (37.5-65.3)	60.2 (52.0-66.5)	45.9 (31.8-59.3)	66.5 (66.5-66.5)
Post-implantation (176)	43.8 (38.4-64.5)	54.2 (35.3-64.5)	58.2 (38.5-66.3)	57.8 (44.8-72.5)	41.5 (23.0-56.2)	63.4 (61.9-65.0)
<i>Reverberation (RV)</i>						
Pre-implantation (163)	87.8 (73.7-97.0)	70.7 (55.7-89.5)	79.7 (62.9-94.8)	72.7 (57.9-90.0)	74.7 (55.0-83.5)	68.5 (67.5-69.5)
6 months post (153)	60.3 (45.2-68.5)	50.0 (34.2-62.3)	54.0 (37.5-74.5)	47.8 (37.5-59.2)	49.5 (35.5-84.6)	81.8 (77.1-86.4)
12 months post (118)	50.0 (41.3-62.5)	44.2 (37.5-60.9)	54.2 (29.2-67.5)	50.0 (48.0-54.8)	47.6 (26.5-56.7)	76.7 (76.7-76.7)
Post-implantation (176)	47.7 (25.0-77.3)	41.7 (33.3-66.5)	50.0 (28.3-70.6)	50.0 (33.4-67.4)	41.7 (29.1-72.7)	74.6 (73.5-75.6)
<i>Aversiveness (AV)</i>						
Pre-implantation (163)	26.1 (16.4-41.7)	28.2 (13.1-38.1)	16.8 (7.3-30.7)	47.7 (25.9-66.3)	32.4 (17.4-41.5)	2.8 (1.9-3.8)
6 months post (154)	52.0 (23.8-70.2)	14.2 (8.3-24.8)	15.1 (8.1-31.3)	45.5 (26.3-64.4)	17.8 (11.2-41.8)	14.6 (11-17.5)
12 months post (118)	47.8 (40.2-56.2)	22.4 (10.1-28.3)	14.5 (4.8-27.1)	25.2 (14.2-35.2)	26.9 (10.4-42.0)	1.0 (1.0-1.0)
Post-implantation (176)	41.5 (30.2-54.8)	16.3 (8.3-26.8)	14.2 (5.8-31.1)	35.3 (18.7-57.1)	12.3 (4.7-29.2)	10.8 (5.9-15.6)