P416

SCREENING AND DIAGNOSTIC NEWBORN HEARING SCREENING

Study of the state and ways of improvement the newborn hearing screening system in megalopolis

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Introduction

The Russian national model of newborn hearing screening (NHS) includes two steps: (1) OAE – based screening of all the newborns in maternity wards or community clinics and (2) ABR in audiology centers for babies who failed OAE or have risk factors. NHS was implemented in 2008, but still the overall coverage of the newborns by screening is 88.6% (2022), only 19% of the children with hearing loss were diagnosed before 3 months, only 5.4% of children started their intervention program before 6 months.

Goal: To reveal the weaknesses, problems and develop the strategy of improvement the NHS in St Petersburg. To achieve this goal the NHS system's audit program was developed and performed.

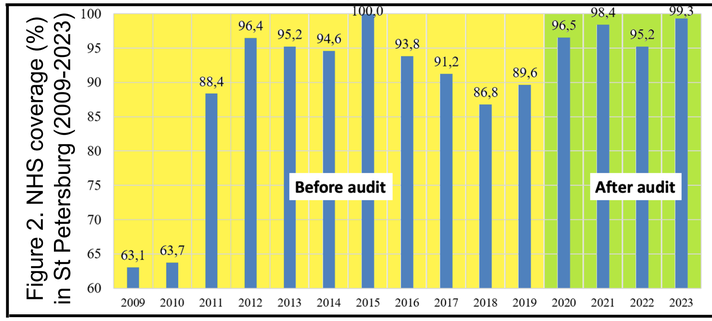

Figure 2. NHS coverage (%) in St Petersburg (2009-2023)

The key NHS results in St Petersburg improved after the audit in 2020. The NHS coverage rate increased from 89.6% (2019) to 96.5% (2020) and 99.3% (2023) – fig. 2. Follow-up rate (to the 2nd stage of NHS) increased on 18%.

Results

After the audit in **2020** only **14%** of inspected institutions met the checklist criteria. The rest 86% of the institutions had some problems (fig. 1).

The audit in **2023** showed that **36%** of institutions met the good practice criteria: 33% of maternity wards, 37% of community clinics (fig. 1).

Figure 1. Problems revealed by the audit of NHS in 2020 and 2023

2020

- Necessity of **renovation the screening equipment** – **61%** of devices are older than 7 years,
- Untimely **calibration** – 20% of devices,
- **Discontinuity in the testing process** (6% in maternity wards, 69% in community clinics),
- **Absence of certificates** in staff – 27% in community clinics,
- Violations in **methodology and testing conditions**,
- Problems with **results' documenting**.

2023

- Necessity of **renovation the screening equipment** – **53%** of devices are older than 7 years,
- Untimely **calibration**,
- **Absence of certificates** in staff,

- Problems with:
  - violations in methodology and testing conditions,
  - discontinuity in the testing process
  - results' documenting

became less common comparing with 2020.

Study design

The audit was performed in 2020 and 2023. The methodology included visits in maternity wards, hospitals, community clinics to check the key indicators of NHS's good practice and collecting filled forms. During the audit workshops were also performed. Some methodological and technical problems with equipment and screening procedure were solved during the inspection.

In 2020 year 78 institutions were visited by audiologists: 16 maternity wards and hospitals, 62 community clinics. In 2023 the audit was performed again, 81 institutions were inspected (21 maternity wards and hospitals, 60 community clinics).

Conclusion

Repeated audit showed that problems with violations in methodology and testing conditions, discontinuity in the testing process and with results' documenting became less common comparing with 2020. Assessment of the screening is an important tool of improving the audiology care services. It helps to reveal problems, develop the management strategies. The audit of NHS system in St Petersburg led to increase the coverage rate and follow-up rate. Repeated audit showed the improvement in following good practice (the number of institutions who met criteria is doubled in 3-years period). Therefore, the audit should be performed on the regular basis.

Materials and methods

The checklist included following points:

- At least 1 OAE device working appropriately,
- No more than 1 year since the last calibration,
- Staff is certified,
- Appropriate testing conditions,
- Appropriate personnel's skills,
- Appropriate documenting.

References

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2. Tufatulin GS, Koroleva IV, Mefodovskaya EK. Epidemiological study of hearing impairments in children: prevalence, structure, amplification, and social factors. Vestn Otorinolaringol. 2021;86(3):28-35.

WCA World Congress of Audiology
19-22 September 2024
Paris, France
CNIT Paris La Défense