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Tracking Children for the Newborn Hearing Screening in Northern Germany

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Abstract and objective

The Newborn Hearing Screening (NHS) in Schleswig-Holstein (northern Germany) covers about 23,000 newborns a year. In Germany NHS has not yet become "universal" for the state but has voluntary activities in many of its federal countries, predominately based on private sponsorship. In Schleswig-Holstein, a multidisciplinary screening program ("UNHS-SH") was started in December of 2003 involving the departments of pediatric audiology, otolaryngology, pediatrics, obstretrics, social medicine, education, medical informatics, and a quality management group supported by the Schleswig-Holstein-division of the German Medical Association. We aimed to fulfil all claims of the international consensus in regard of screening procedures, quality management, tracking, follow-up, and timing. All of the 28 birth hospitals participate in the screening. In 2005, the mean participation rate was 81.6 %, while seven hospitals reached over 90 %. Lost to follow-up was 1.5% and 16 hard hearing newborns (of the statistically expected 23) were discovered by the UNHS-SH. UNHS-SH shows that an internet tracking with intensive feedback to screeners and parents is a candidate to overcome the potential drawbacks of a voluntary screening.

Keywords:

tracking, newborn hearing screening, hardness of Hearing

Introduction

As a voluntary approach, an Universal Newborn Hearing Screening was started in Schleswig-Holstein (northern Germany) in December 2003 ("UNHS-SH"). The multidisciplinary screening program is arranged in a highly multidisciplinary fashion including the departments of pediatric audiology, otolaryngology, pediatrics, social medicine, or medical informatics. Currently UNHS-SH serves for approximately 23,000 newborns a year in Schleswig-Holstein, further federal countries are joining.

Methods

Healthy newborns are screened bilaterally with a two-step-screening (otoacoustic emissions; OAE) and newborns at risk bilaterally with a one-step-screening (automated auditory brainstem response; AABR). If necessary, an immediate follow-up is performed in the university hospitals (Fig. 1).

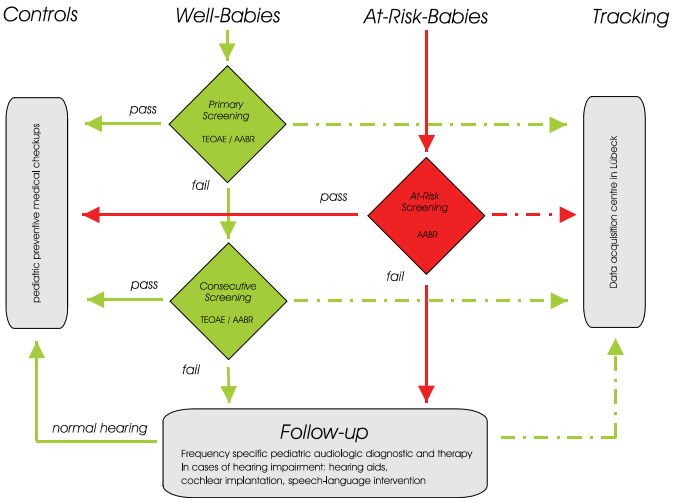

Figure 1 - Timing chart of the UNHS-SH: At-Risk-Babies are obligatory screened using AABR technique. Well-Babies undergo a primary screening (mostly by OAE) and if necessary a consecutive screening.

Results are noted in paediatric development protocol and also send to the data acquisition centre in Lübeck via the internet or email-attachment using special software for data acquisition (Fig. 2).

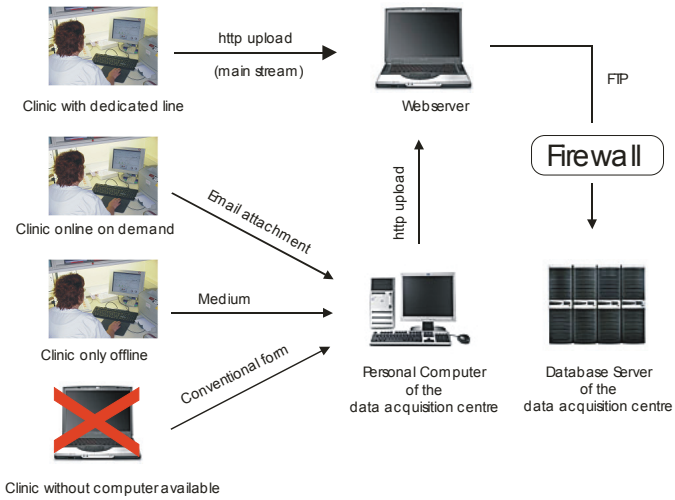

Figure 2 - Data flow of the UNHS-SH: Data are mainly transferred using http upload but some nurses have no access to the internet

Needs for 2nd step screenings or a follow-up are automatically recognized by the software in the data acquisition centre in Lübeck. Parents are then informed by automatically generated letters (up to three times if necessary, afterwards telephone call). If they changed their addresses, local authorities are involved to find them. The tracking software used supports the above mentioned activities by providing to-do lists (Fig. 3).

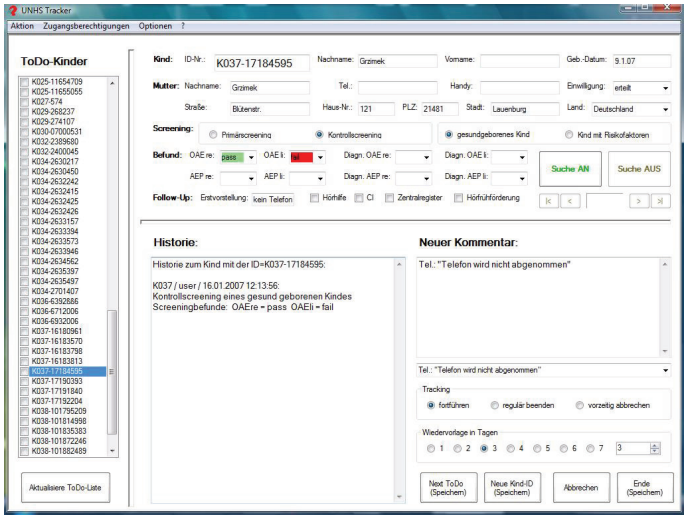

Figure 3 - Screenshot of the tracking software. Picking a child of the to-do list on the left hand side displays all corresponding information like address data or history. Dummy patient

Moreover, the tracking software provides statistics as a feedback to the institutions involved. The statistics comprise rates as demonstrated in Tab. 1.

Rate	Meaning
Acquisition rate	Ratio of registered babies relating to total number of newborns
Screening rate	How many % of the registered babies have been screened in hospital?
Consent rate	How many % of the parents have given their consent for tracking?
Fail rate	How many % of the screened babies have been considered „fail“?

Table 1 - Some of the statistics provided by the tracking software of the UNHS-SH

Results

All of the 28 birth hospitals participate in the screening, while the biggest 25 hospitals participate in the tracking and three smaller ones are prepared to join soon. In 2005, the mean rate was 81.6 %, while seven hospitals reached over 90 %. All hospitals and practitioners are periodically informed about their statistics compared to the other in order to keep their motivation. In case of a rate below 60 %, a mobile service gives an on-site training session. In 2005, lost to follow-up was 1.5 % and 16 hard hearing newborns (of the statistically expected 23) were discovered by the UNHS-SH and fitted with hearing aids beyond the age of nine months (six months desired, of course).

Discussion and conclusion

In Germany, a voluntary screening instead of an obligate is going to be installed nationwide. Thus, acquisition rates and lost-to-follow up rates are problematic issues. The UNHS in northern Germany shows that a far-reaching automatic internet tracking with intensive feedback to screeners and parents is a candidate to overcome the potential drawbacks of a voluntary screening. Thus the UNHS-SH approach might be suited for other countries building up a NHS of their own.