

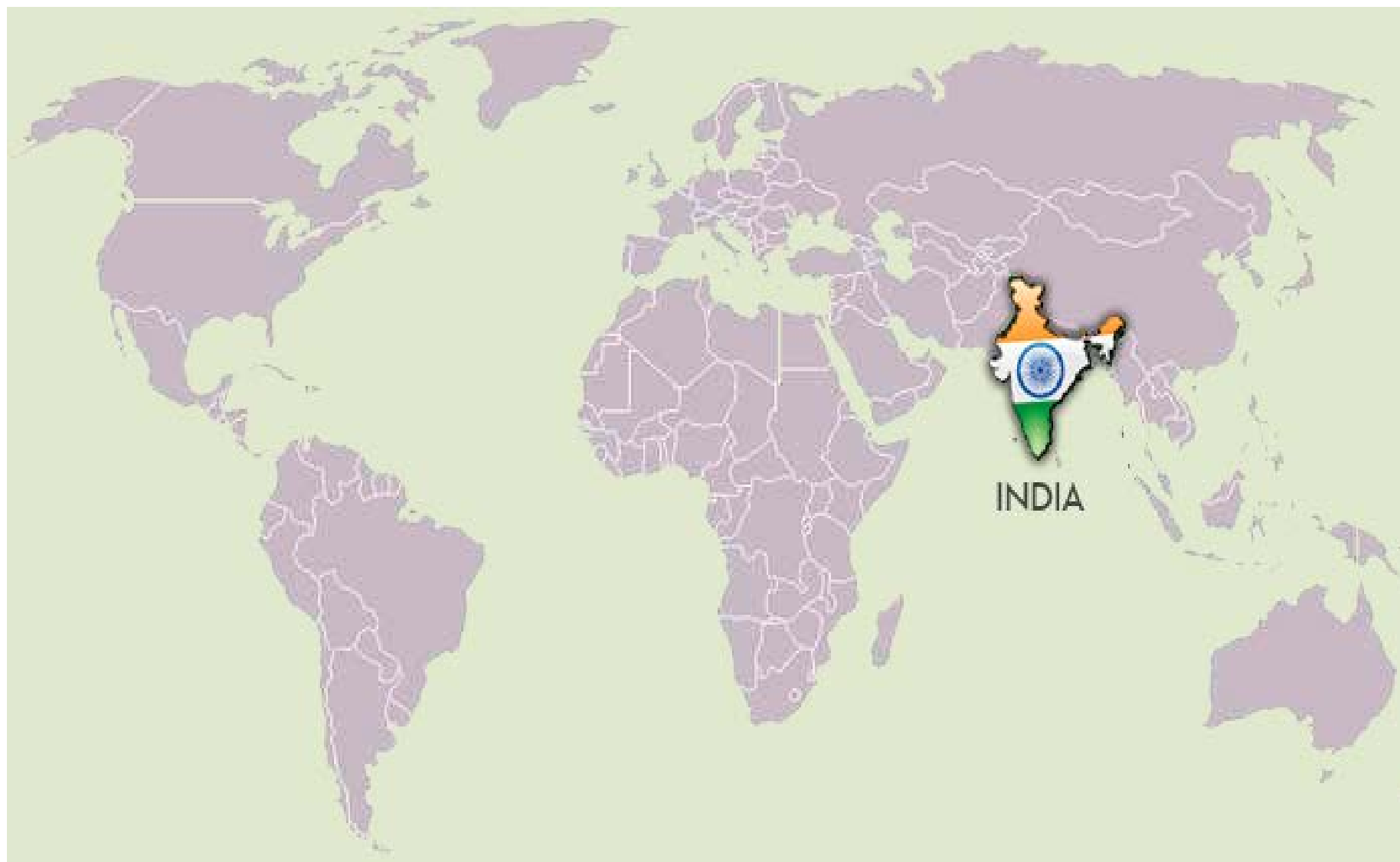
Overcoming challenges of delivering Newborn Hearing Screening program in a tertiary care hospital in India

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BACKGROUND & MOTIVATION



Early detection of hearing loss



Hearing loss is one of the congenital birth abnormalities which have a serious effect on the child's development



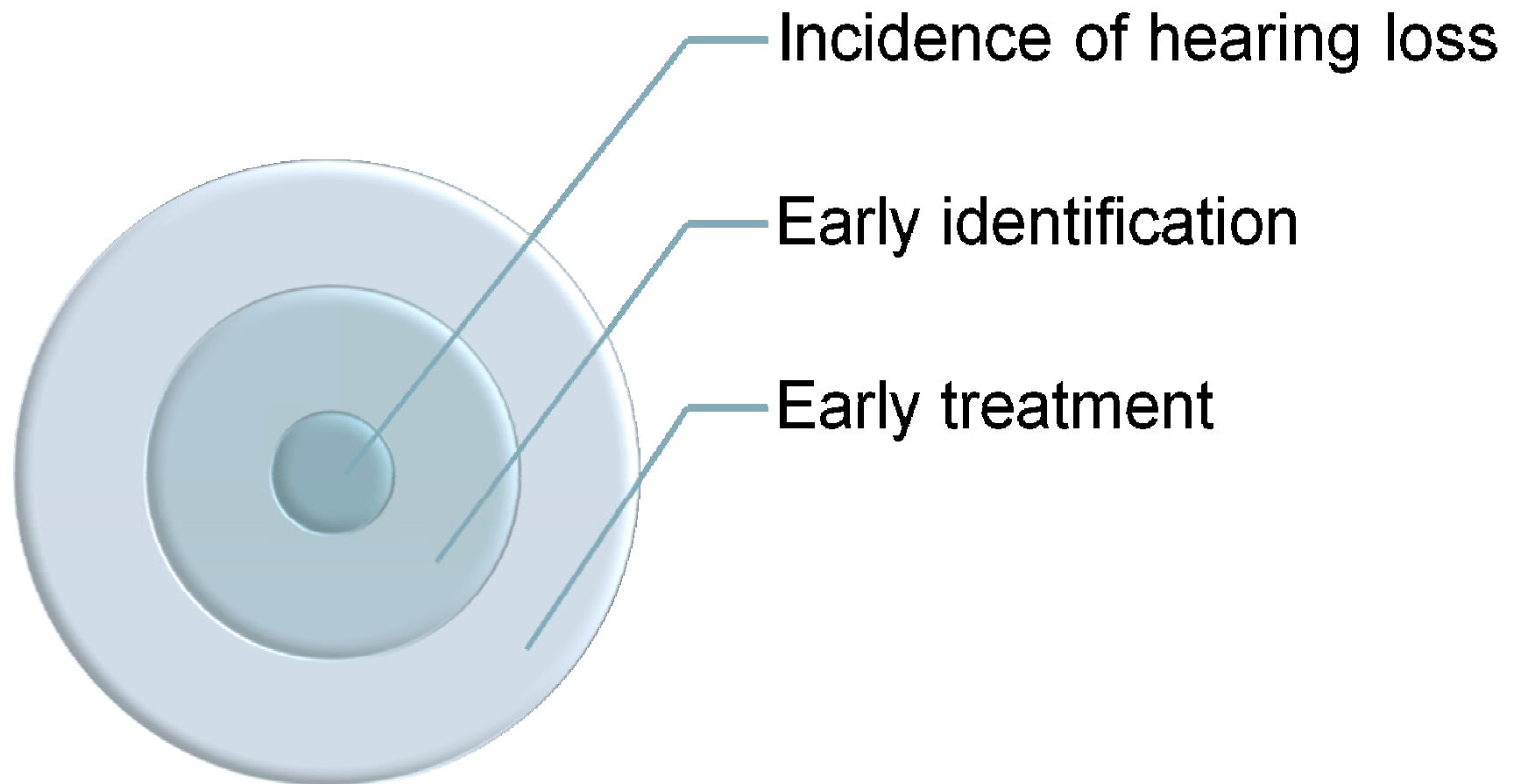
Early detection of hearing loss facilitates effective treatment to the child



Newborn hearing screening (NHS) identifies hearing loss >30 dBHL



Importance of NHS



Stages in NHS program

Screening at birth or within one month of age

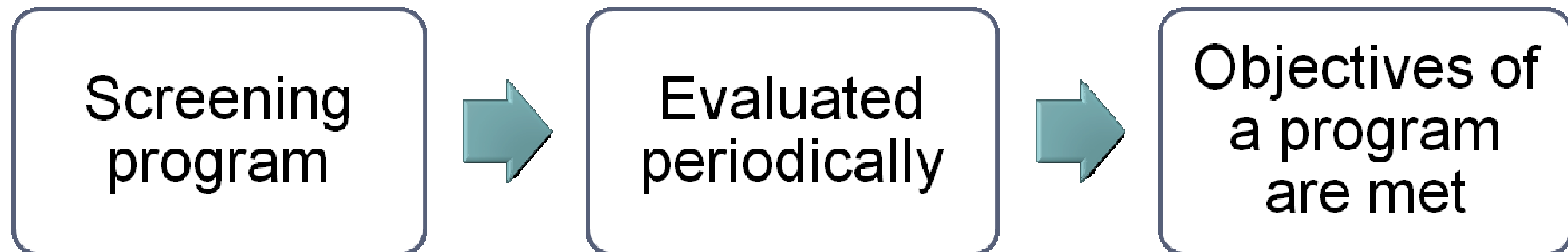
Follow up for diagnosis within three months of age

Intervention services by six months of age

Each stage is interconnected & breakdown at any of these stages affects the program



Evaluating the screening program



JCIH (1994) endorses benchmarks for Newborn Hearing Screening (NHS)

- Referral rate < 4%
- Follow up of 70% of referred infants



Aim of the study

- To systematically document the challenges faced during the implementation of NHS program in a developing country
- To study the outcome of various strategies used to overcome the challenges



Sri Ramachandra NHS program

Program commenced in 2005

Challenges faced

- Percentage of screening coverage was low when screening was done as an inpatient procedure
- Equipment failure
- Reduced follow up percentage

Steps taken to overcome

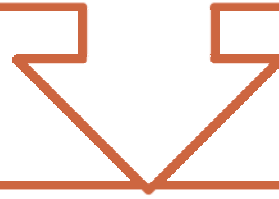
- Screening done as outpatient procedure for all babies born at Sri Ramachandra Medical Centre
- Backup equipment
- Extensive counseling to parents to facilitate follow up for further testing



NHS protocol changed with time

Overcoming challenges in NHS program

One of the challenges is lost to follow up (LFU) at various stages of the program

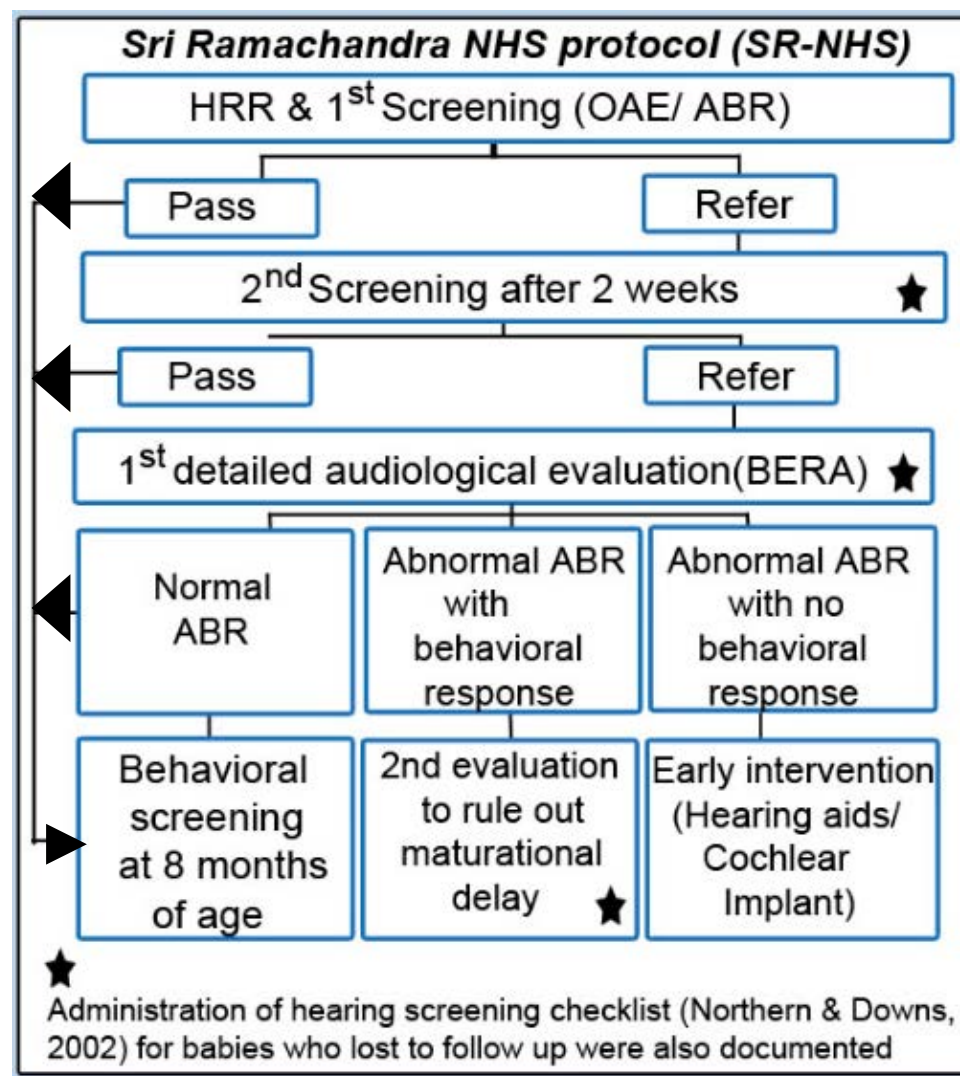


New strategies need to be adopted to know the hearing status of the babies who LFU



Sri Ramachandra NHS protocol, India

After a thorough evaluation, the **two step screening & telephone follow up (TFU)** were included & this protocol was established in 2010



Hearing Screening Checklist

- 1. When your child is sleeping does he move/ begin to wake up to a loud sound?
- 2. Does your child try to turn his head towards an interesting sound or when his name is called?
- 3. Does he enjoy ringing a bell, playing with a noisy toy
- 4. Does your child startles when hearing a loud noise?
- 5. Does your child babbles to self?
- 6. Does your child become quiet to familiar voices?
- 7. Does your child respond to request?
- 8. If sounds are given while your child crying, does your child stops crying?
- 9. Does your child able to make connections between sounds and objects/ people?
- 10. Does your child locate the sound from different sides?



Objective

- To determine if SR-NHS protocol meet International benchmarks (referral rate $<4\%$ and follow up of 70% of infants or more) when two stage screening and TFU were incorporated



METHOD



Subjects

- Retrospective study
- Data of 1135 babies born between September 2011 and August 2012 were extracted
- Percentage analysis was done



Screening environment & equipment

- Hearing screening was done in a sound treated room.



Oto acoustic emission

All babies



Automated Auditory Brainstem Response

Neonatal intensive care unit stay (NICU) for >4 days or presence of hyperbilirubinemia (>13mg/dl)



Screening procedure

The screening was performed with the baby on the mother's or caretaker's lap.

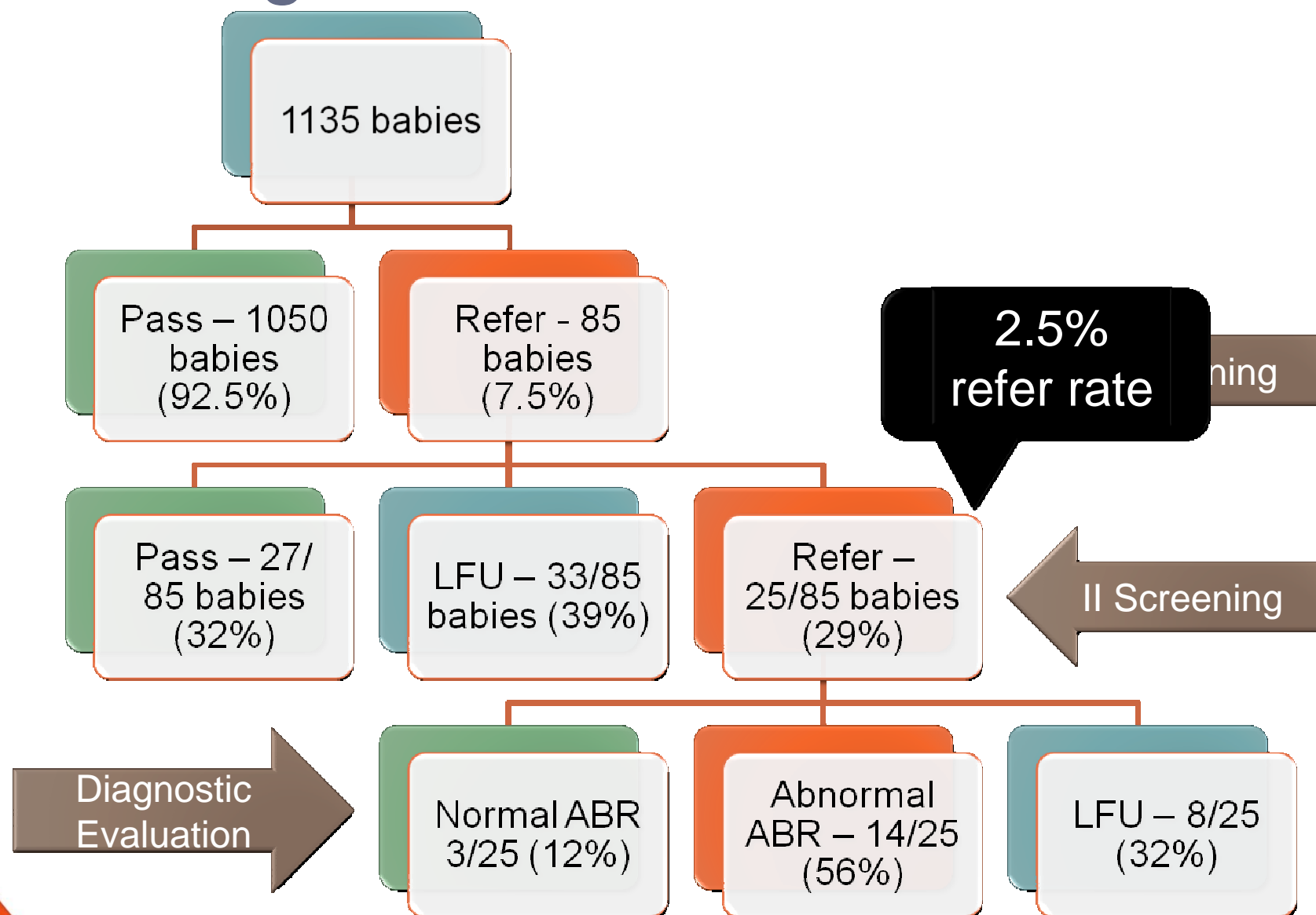
Screening was done by graduate students of audiology and rescreening (for babies with 'refer' results) will be done by audiologist who expertise in newborn hearing screening.



RESULTS & DISCUSSION



Screening results of 1135 babies



Hearing status of the babies

- Only 5 (out of 14 babies referred) babies came for the second diagnostic evaluation

2 - Sensorineural hearing loss


2 - Auditory maturational delay

1 - Conductive hearing loss




Overcoming the challenge of LFU

Overall, 58% (50/85) of the babies were LFU



Follow up of babies is difficult at every stage of NHS program



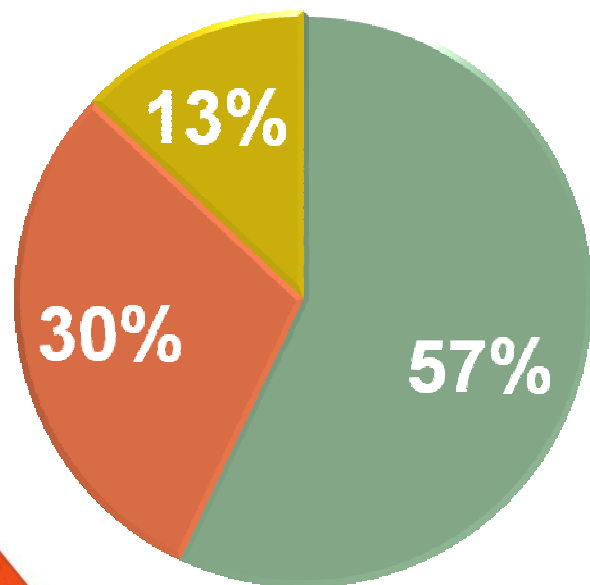
Checklist based hearing screening through phone
(Telephone follow up)



Telephone follow up (TFU)

- In TFU, 20 /50 could not be contacted due to change of numbers.
- Among others, two did not pass the screening checklist were referred for diagnostic testing

Reasons for LFU



- Convinced that the child can hear (17)
- Distance, pre-occupied work & personal issues (9)
- Child's hearing has been screened elsewhere (4)



Outcome of implementing TFU

- Telephone follow up has decreased the LFU from 58% to 24% bringing it very close to the international standards.
- Previous studies show that without phone follow up, the benchmarks for the Indian conditions may be higher (Kuthalingam, Nagarajan & Janet, 2008; Paul, 2011).



CONCLUSION



Objectives of the SR-NHS program was to have low referral rate and high follow up rate

Referral rate
at the end of 2nd
screening



2.2% meeting
International
benchmarks
($<4\%$)

**Follow up
rate**
low (42%)



TFU
hearing
status of
30 more
babies



Increased
the follow
up from
42% to
72%



Take home message

- NHS protocol should be fine tuned & adapted to suit local condition
- Two stage screening facilitates a low referral rate and TFU screening increases the follow up percentage and helps meeting International benchmarks



Our team

Audiologists

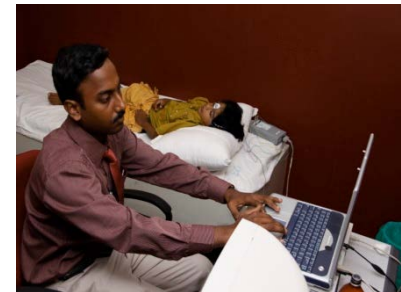
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- Mr. Heramba Ganapathy
- Ms. Jayashree. S
- Ms. Aishwarya Nallamuthu

Neonatologists

- Dr. Binu Ninan
- Dr. Prakash. A



Thank You



Any Suggestions or Questions

