



HEARING OUTCOMES IN CHILDHOOD BACTERIAL MENINGITIS

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AIMS

To establish the rate of sensorineural hearing loss following bacterial meningitis in Lothian

To establish if our local pathway for post meningitis audiological follow up is being followed.

Background

Recognised risk of sensorineural hearing loss following bacterial meningitis

Quoted as 10%

Studies report lack of follow up information and high DNA rate, varied timing of follow up etc

Paucity of literature

Background

Local guideline for audiological follow up developed in 2009 (reviewed 3 yearly)

Agreed between ENT, Audiology and CCH

Urgent age-appropriate hearing assessment on referral

Identified significant hearing loss.....aiding / CI referral / imaging

Mild / moderate loss.....repeat in 4 weeks, 6 weeks, 12 weeks, 6 months, annually

Normal hearing.....repeat in 6 months, 1 year, discharge

AUDIT METHODOLOGY

We received a list of 30 patients from the coding department at Royal Hospital for Sick Children (RHSC) who had been given a discharge code of any one of the following in the period from December 2009 to December 2014.

Bacterial meningitis

Pneumococcal meningitis

Streptococcal meningitis

Meningococcal meningitis

E Coli meningitis

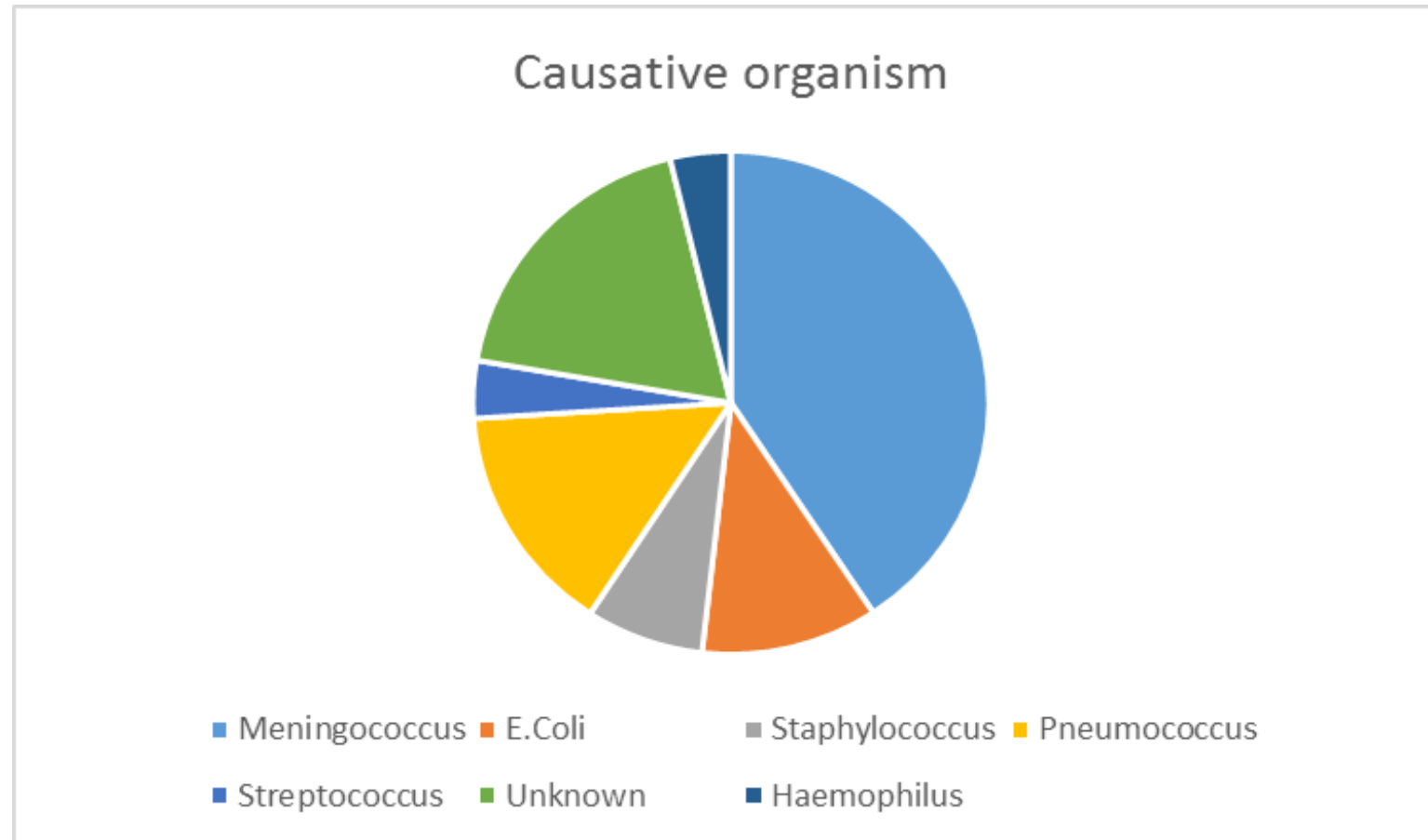


We excluded children who died during the illness and those who had been incorrectly coded (all patients' casenotes were reviewed to establish safety of diagnosis).

A total of 27 children (age range 6 weeks of age to 10 yrs old) satisfied the above conditions

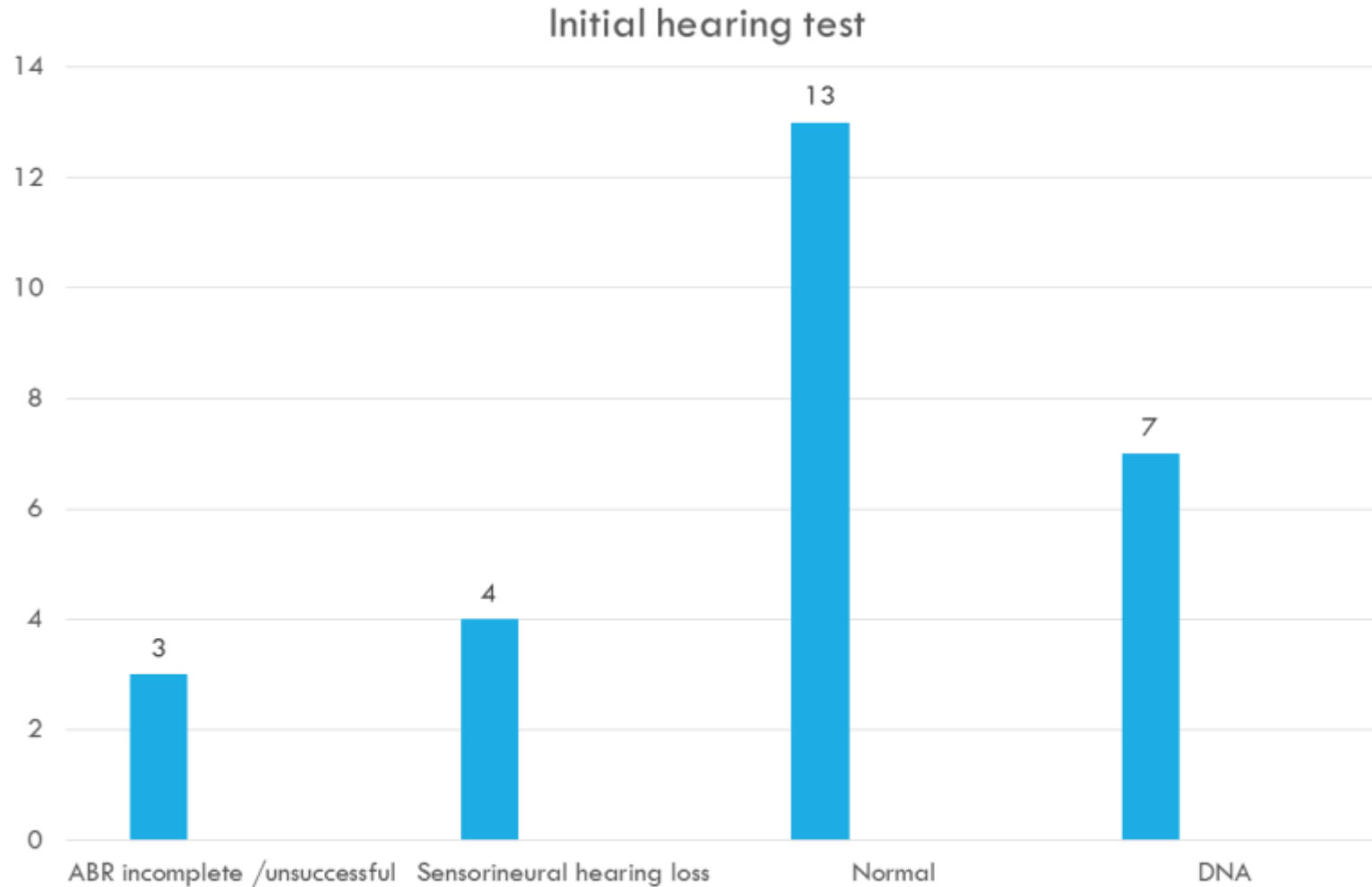
DEMOGRAPHICS

Mean age at presentation was 24 months (range 6 weeks – 10 years)



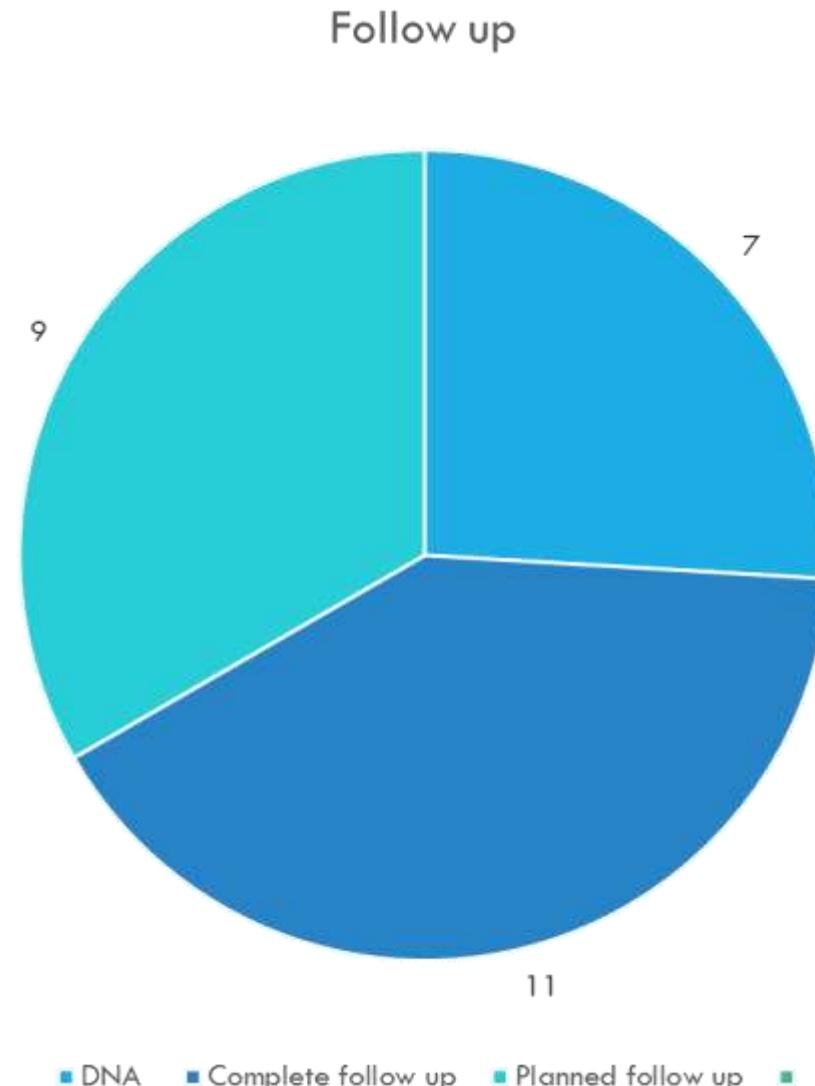
RHSC RESULTS-INITIAL TESTING

74% of children had an initial hearing test.



RHSC RESULTS — FOLLOW UP

What percentage of children had complete follow up or have it arranged ? 74%



RHSC RESULTS — FOLLOW UP

What is the DNA rate for follow up? $7/27 = 26\%$

What percentage of children had an abnormal result? $4/27 = 14.8\%$
(All unilateral sensorineural hearing loss)

Guideline followed? $25/27 = 92.6\%$

NEONATAL RESULTS

We received a list of babies born in the past five years from December 2009 to December 2014 who were inpatients in the neonatal unit. This data was sorted and babies who satisfied any one of the following were included in the audit:

- Positive CSF culture (not including those felt to be contaminants)**
- Raised WCC + clinical concern of bacterial meningitis**
- Discharge diagnosis of bacterial meningitis**

We excluded babies who had viral meningitis . A total of 17 babies satisfied the above conditions.

Neonatal Results

17 patients in the neonatal unit with bacterial meningitis.

The guideline was followed in **94%** of cases

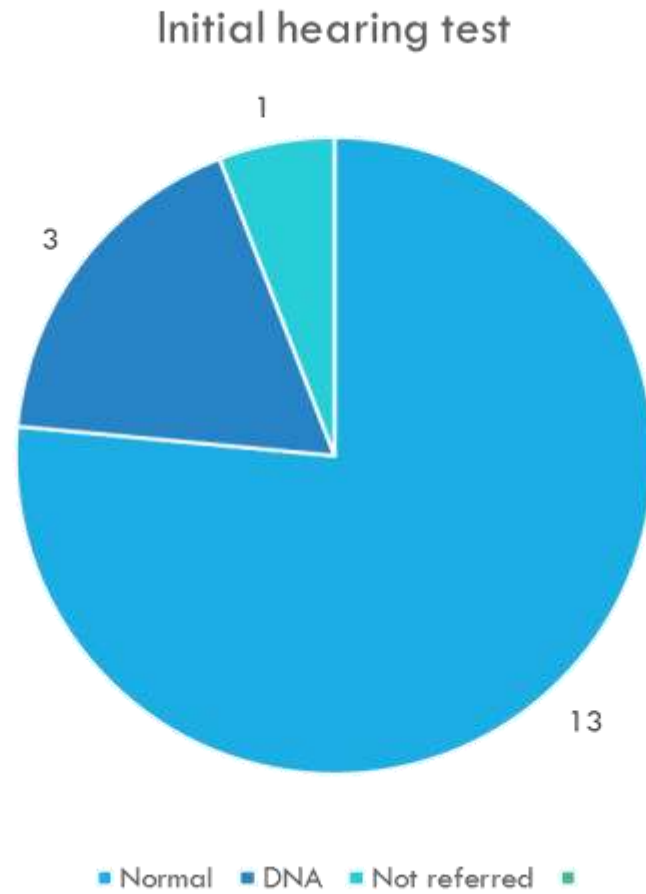
76% of babies had an initial hearing test – this was due to a DNA rate of 17.6% and one patient having not been referred.

52.9% of babies had completed follow up

17.6% have follow up planned.

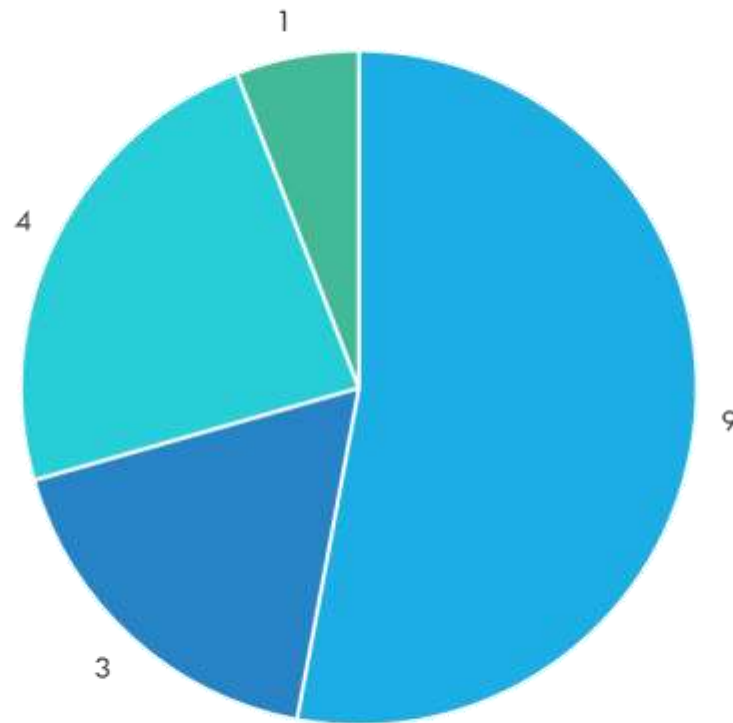
No babies were found to have hearing loss on initial or follow up testing.

NEONATAL RESULTS



NEONATAL RESULTS-FOLLOW UP

Follow up testing



■ Complete follow up ■ Follow up planned ■ DNA ■ Not referred

Discussion

Small numbers in this audit

Rate of meningitis 5-7 per 100000 (standard in developed countries)

High DNA rates as noted in literature

No significant bilateral hearing loss identified in this cohort

Discussion

Next steps....

- 1) Amend the referral form to include section on checking that parents have had an explanation and consent for hearing testing
- 2) Referring teams to liaise directly with audiology to arrange appointment date at time of discharge
- 3) Information sheet for parents

REFERENCES

- 1 BaraVLJ, Lee SI, Schriger DL. Outcomes of bacterial meningitis in children: a meta-analysis. *Pediatr Infect Dis J* 1993;12:389-94.
- 2 Fortnum HM. Hearing impairment after bacterial meningitis: a review. *Arch Dis Child* 1992;67:1128-33.
- 3 Richardson et al. Hearing loss during bacterial meningitis *Archives of Disease in Childhood* 1997;76:134–138
- 4 NICE guideline No102; Bacterial Meningitis and Meningococcal Septicaemia: Management of Bacterial Meningitis and Meningococcal Septicaemia in Children and Young People Younger than 16 Years in Primary and Secondary Care. 2010
- 5 SIGN guideline 102. Management of invasive meningococcal disease in children and young people. 2008