Innovative approach to the redesign of an under-recruiting RCT: lessons from the BASE Trial

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BACKGROUND

The trial:

- Metabolic acidosis is common in very preterm infants. Sodium bicarbonate is frequently used as treatment, but practice varies widely.
- The **BASE** Randomised Controlled Trial (RCT) compared sodium bicarbonate vs no treatment for metabolic acidosis episodes.
- At six months, 13 infants had been recruited, compared with a target of 186.

The 'Problem with Recruitment'

Enhanced screening logs exploring why infants were not randomised found:

- Lower than expected prevalence of metabolic acidosis
- Greater use of sodium bicarbonate prior to randomisation → reducing the number of infants eligible

AIM

To redesign the BASE RCT to a mixed-methods study to prevent research waste and generate valuable evidence

METHODS

12 Month Redesign Process & Outcome:

- After six months of recruitment, a funder progress report was provided.
- Funder requested a proposal for alternative options to address the research question, within the existing structure and funding.
- The team co-developed redesign options with oversight committees, the sponsor, and PPI representatives.
- After a 12-month redesign process, the funder approved a new mixed methods approach: converting the RCT to a **feasibility trial** and adding **observational** and **qualitative studies**.

THE BASE STUDIES: BEFORE AND AFTER REDESIGN

BASE
Bicarbonate for AcidosiS in very pretErm babies

BEFORE: Original Plan

A large randomised controlled trial
to investigate the use of sodium bicarbonate for metabolic acidosis in very preterm infants.

BASE RCT (Original Plan)

Planned sample size **3764**

Approximately **45 neonatal units**

What happened?

Recruitment was substantially below target

- Lower than expected incidence of metabolic acidosis
- Limited eligibility due to clinician equipoise
- Increased use of intra-arterial sodium bicarbonate
- Fewer sites than planned

The funder approved a re-designed mixed-methods programme.

The original RCT is being converted into a feasibility trial.

AFTER: The BASE Studies

(Redesigned Programme)

A **mixed-methods** programme to understand current practice, assess feasibility and inform the design of a future definitive randomised controlled trial.

BASE RCT Feasibility Trial

720 infants consented
110 randomised
8 neonatal units

Aim: To assess the feasibility of conducting a RCT in very preterm infants with metabolic acidosis.

Integrated Qualitative Study

~50 participants
Healthcare professionals, staff and parents

Aim: To explore experiences and barriers to recruitment and how research is communicated with families

Observational Study

750 infants enrolled
22 neonatal units

Aim: To understand the prevalence of metabolic acidosis, how it is managed, and its association with health outcomes.

Still contributing to the same research goal

Building the evidence on sodium bicarbonate and metabolic acidosis in very preterm infants, while informing the design of a future definitive RCT.

CONCLUSION

- Demonstrates how an under-recruiting RCT can be successfully redesigned rather than **closed**.
- Reduces research waste by **preserving existing infrastructure**, funding and participant data.
- Generates the evidence needed to design a future definitive trial while strengthening the evidence base for sodium bicarbonate use in very preterm infants, and robust prevalence estimates of metabolic acidosis.

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