Beta-blocker Efficacy Assessment using MRI in Guiding Therapy of Varices (BEAMinG)

Naaventhan Palaniyappan
NIHR Academic Clinical Clinical Lecturer
University of Nottingham
Background
Hepatic Venous Pressure Gradient (HVPG)

- Prognosis
- Assessment of treatment response

BUT...
- Invasive
- Not widely available
- Expensive
Quantitative MRI in Portal Hypertension

- Combination of
  - Liver T1
    - liver architecture
  - Splenic artery velocity / SMA velocity
    - splanchnic haemodynamics

- Non-contrast scan
- Short scan time
- 1.5 T scanners

Palaniyappan 2016 J Hep
Validation at 3T

Scott EASL 2019
Beta-blocker Efficacy Assessment using MRI in Guiding Therapy of Varices (BEAMinG)

Submitted to EME Researcher-led Call 18/170
Aim

To compare changes in splanchnic haemodynamic and structural MRI measures with changes in HVPG in patients with cirrhosis and varices treated with carvedilol
Objectives

• To harmonise the Nottingham MRI protocol validated as a surrogate for HVPG across research centres.
• To evaluate if changes in quantitative MRI measures reflect changes in HVPG following carvedilol treatment in the primary prophylaxis for varices.
• To investigate the mechanism of action of carvedilol by evaluating the changes in splanchnic and collateral flow, cardiac function, and liver T1.
Chief Investigator: Guruprasad Aithal

Team

- Hepatology
  - Nottingham – N Palaniyappan, IN Guha, S Ryder
  - Edinburgh – J Fallowfield, P Hayes
  - UCL – R Mookerjee
  - Birmingham – D Tripathi
  - Derby – A Austin
- Physics/Radiology
  - Nottingham – S Francis
  - Edinburgh – S Semple
  - UCL – M Chouhan
- Nottingham CTU
  - A Montgomery
  - C Partlett
Project plan

• Stage 1
  • Dissemination and harmonisation of quantitative MRI protocol across sites
  • QA scans including phantoms and healthy volunteers

• Stage 2
  • Prospective, cross-sectional study
Medium/large oesophageal varices identified on gastroscopy

Patients recruited to CALIBRE study

Randomised to Carvedilol Arm

Patients decline to participate in CALIBRE

Decision to commence Carvedilol

Baseline HVPG and MRI within 2 weeks

Carvedilol 12.5mg once a day

Repeat HVPG and MRI after 4-12 weeks of treatment

Standard care

CALIBRE study

BEAMinG study
Statistical analysis

• Pearson correlation to determine strength of correlation between change in MRI measures and change in HVPG

Sample size

• Conservatively assuming a correlation of 0.72 between change in MRI and change in HVPG, n=94 required to ensure lower limit of 95% confidence interval is at least 0.6.

• Allowing 20% drop-out, we aim to recruit 118 patients.
Thank you

naaventhan.palaniyappan@nottingham.ac.uk
@navpalani
Not all T1 measurements are the same…