

Characteristics of the gastrointestinal microbiota in paired live kidney donors and recipients

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Background

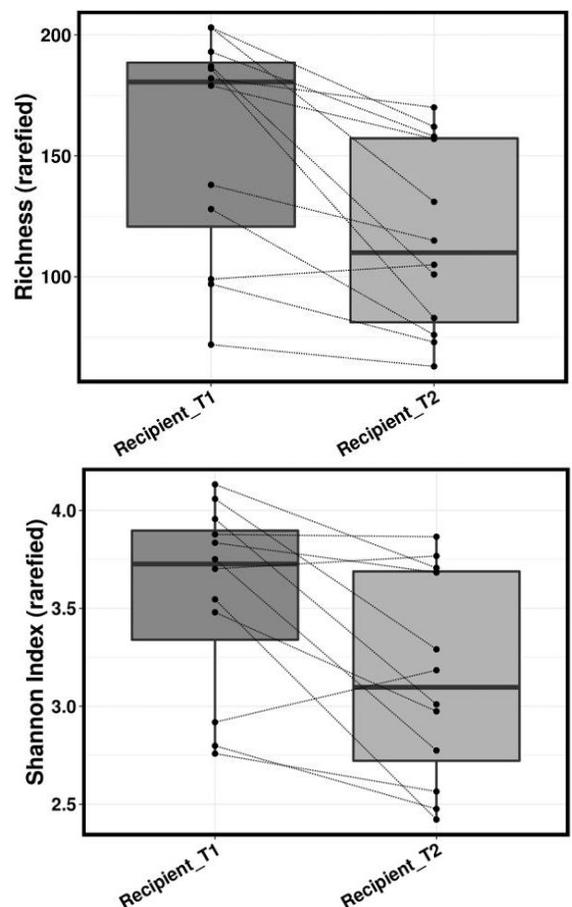
- Recent surge of interest in relationship between **gastrointestinal microbiota** and **chronic disease**
- Infections** are hypothesised to be associated with **changes** in gastrointestinal microbiota in **kidney transplant patients**
- The aim of this study was to examine whether alterations in **microbial richness, diversity and composition** occur after transplantation in both kidney **donors and recipients**

Methods

- Kidney transplant recipients and donors **prospectively enrolled**
- Collected **one faecal sample prior** to surgery and **another between four to eight weeks** post-surgery
- Gastrointestinal microbiota richness, Shannon diversity measures and functional assessments of kidney donors and recipients analysed

Results

- 12 donors and 12 recipients** (median donor age 56 years, recipient 51 years)
- Donor** microbiota showed **no significant changes**
- Recipient microbiota altered post-transplant
 - Reduced mean richness values** (156 ± 46.5 to 116 ± 38.6 , $p=0.002$) (Figure 1A)
 - Reduced Shannon diversity** (3.57 ± 0.49 to 3.14 ± 0.52 , $p=0.007$) (Figure 1B)
 - Increased *Roseburia* spp.** abundance post-transplant (26-fold increase from 0.16 ± 0.0091 to 4.6 ± 0.3 ; $p=0.006$; $FDR=0.12$)
 - Functional post-transplant microbial community shifted towards taxa using **glycolysis** for energy metabolism
 - Decrease** in functions involved with **reactive oxygen species** degradation



Conclusions

- This pilot study provides the **first taxonomic and functional insights** into the gut microbiota of living donors and kidney transplant recipients
- Significant decreases in gut microbial richness and diversity** in recipients post-kidney transplant, but **mechanism of changes remains unknown**
- Gut microbiota of recipients shifted towards a community with taxonomic and metabolic potential **more compatible with reductions in epithelial oxidative stress and inflammation, and in favour of gut homeostasis**
- Further studies needed to ascertain how **gut microbial diversity** and functionalities correlate with **clinical events**, what factors underpin observed changes in recipients and how to **sustain positive alterations long-term** in kidney transplant recipients