Nutrition support and the gastrointestinal microbiome post allogeneic transplantation

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Aim
This study aimed to determine if there is a difference in the microbiome between patients receiving enteral nutrition and parenteral nutrition post allogeneic stem cell transplantation.

Methods
Twenty-three patients received either early enteral nutrition or parenteral nutrition commenced as required. Stool samples were collected at 30 days post-transplant and analysed with shotgun metagenomic sequencing.

Results
There was no difference in microbial diversity between patients who received predominant enteral nutrition (n=13) vs parenteral nutrition (n=10) however patients who received enteral nutrition had greater abundance of several taxa associated with increased short chain fatty acid production including Faecalibacterium (p<0.001) and Ruminococcus E bromii (p=0.026). Patients who had minimal oral intake for a longer duration during provision of nutrition support had a different overall microbial profile (p=0.044), lower microbial diversity (p=0.004) (Figure 1) and lower abundance of Faecalesibacterium prausnitzii C (p=0.030) and Blautia (p=0.007) compared to patients with greater oral intake. Lower microbial diversity was found in patients who received additional beta lactam antibiotics (p=0.042) and had a longer length of hospital stay (p=0.019) (Figure 2).

Conclusions
Post allogeneic stem cell transplant oral intake should be encouraged to maintain microbiota diversity and if nutrition support is required enteral nutrition may promote a more optimal microbiota profile. The effect of fibre containing enteral nutrition on the microbiome should now be evaluated.

Figure 1: Higher microbial diversity for length of hospital stay < 30 days (n = 16) versus ≥ 30 days (n = 7)

Figure 2: Higher microbial diversity for shorter duration of minimal oral intake during feeding (n = 11) versus longer duration of minimal oral intake during feeding (n = 8)