



Antihypertensive Therapy and the Gut Microbiome in Alzheimer's Disease: Microbiome Signatures of ACE inhibitor and ARBs use



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ACE inhibitors and ARBs did not alter overall gut microbial diversity, but were associated with specific bacterial changes in AD, suggesting a potential interaction between blood pressure medications and the gut-brain axis(GBA)

Introduction

- Alzheimer's disease (AD) affects nearly 50 million people worldwide, including approximately 100,000 individuals in Puerto Rico (PR).
- Hypertension is one of the most important modifiable vascular risk factors for cognitive decline and AD.
- PR has a high prevalence of both AD and hypertension, providing a unique population in which to investigate vascular contributions to neurodegeneration.
- Emerging evidence suggests that the gut microbiome may influence neuroinflammation through the GBA
- ACE inhibitors (ACEis) and angiotensin receptor blockers (ARBs) can modify the gut microbiome and may indirectly affect pathways involved in AD.
- We investigated whether ACE inhibitor/ARB use is associated with differences in gut microbial diversity among individuals with AD and cognitively healthy controls.



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Methods

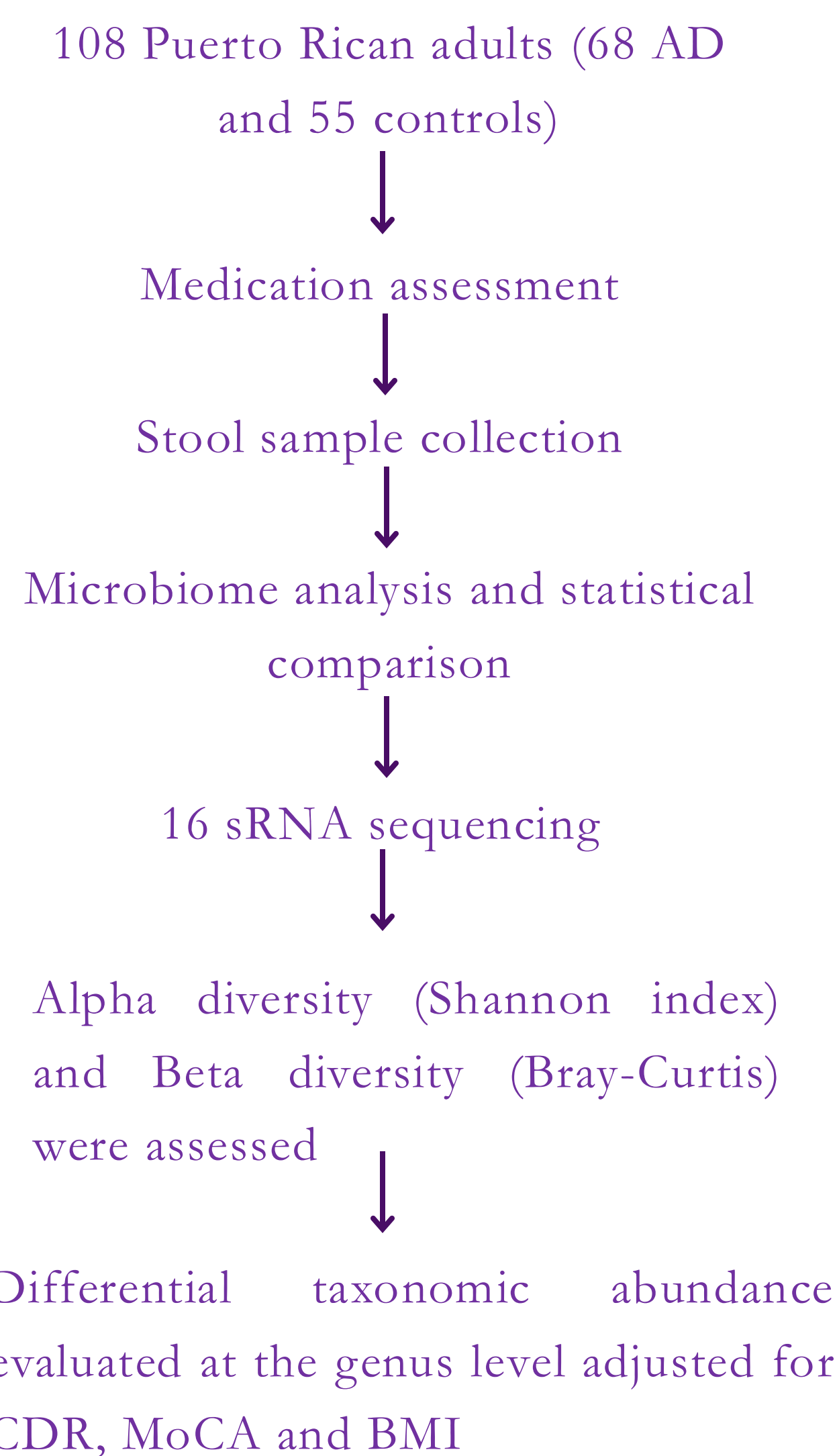


Figure 2: Taxonomic profiles at the Genus level. *Blautia* depicted on similar richness and composition of microbiota. AD patients that use ACEi/ARBs show a decrease of *Agathobacter* and a higher relative abundance of *Bifidobacterium*.

Results

Table 1: Patient's characteristics

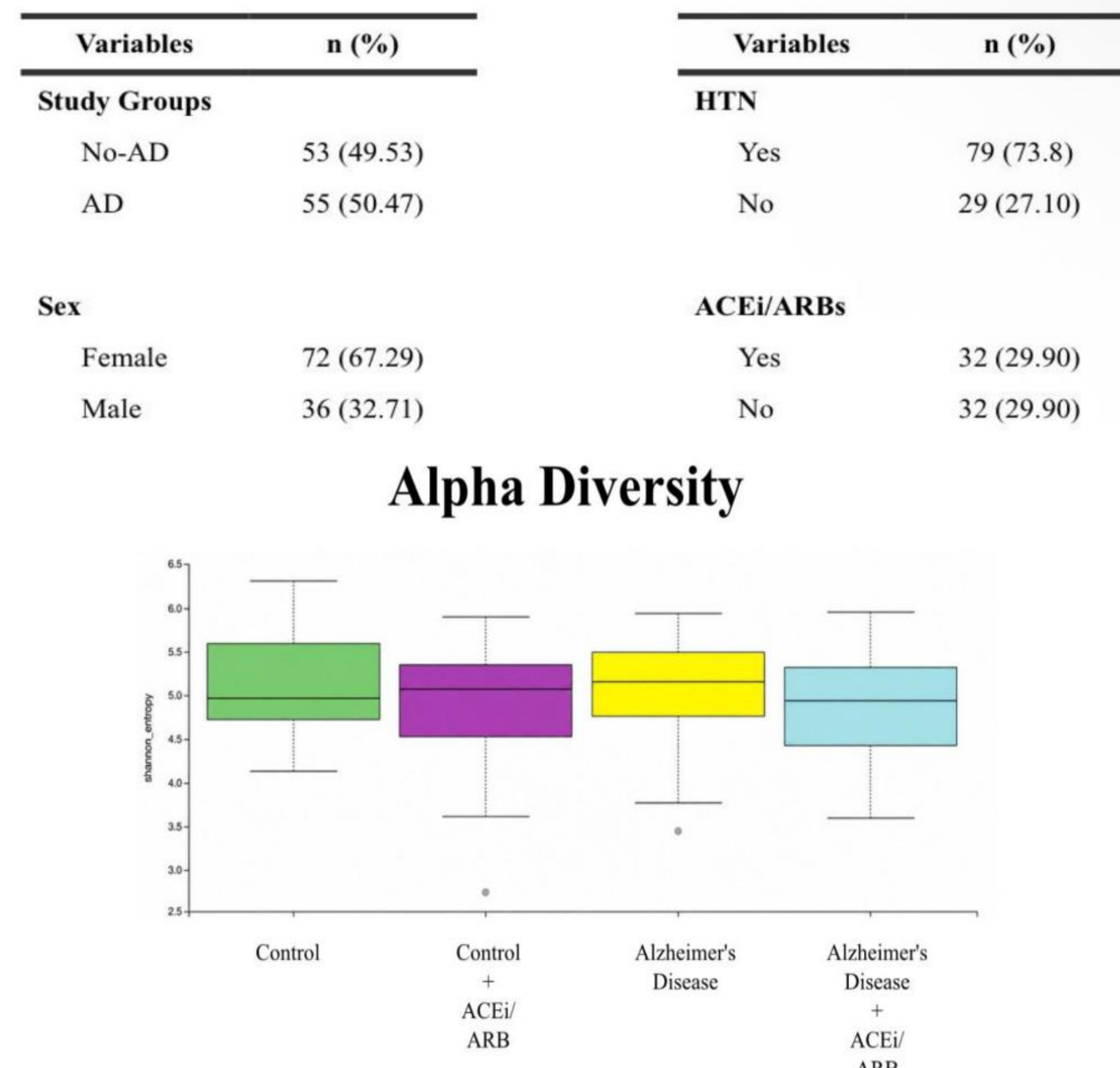
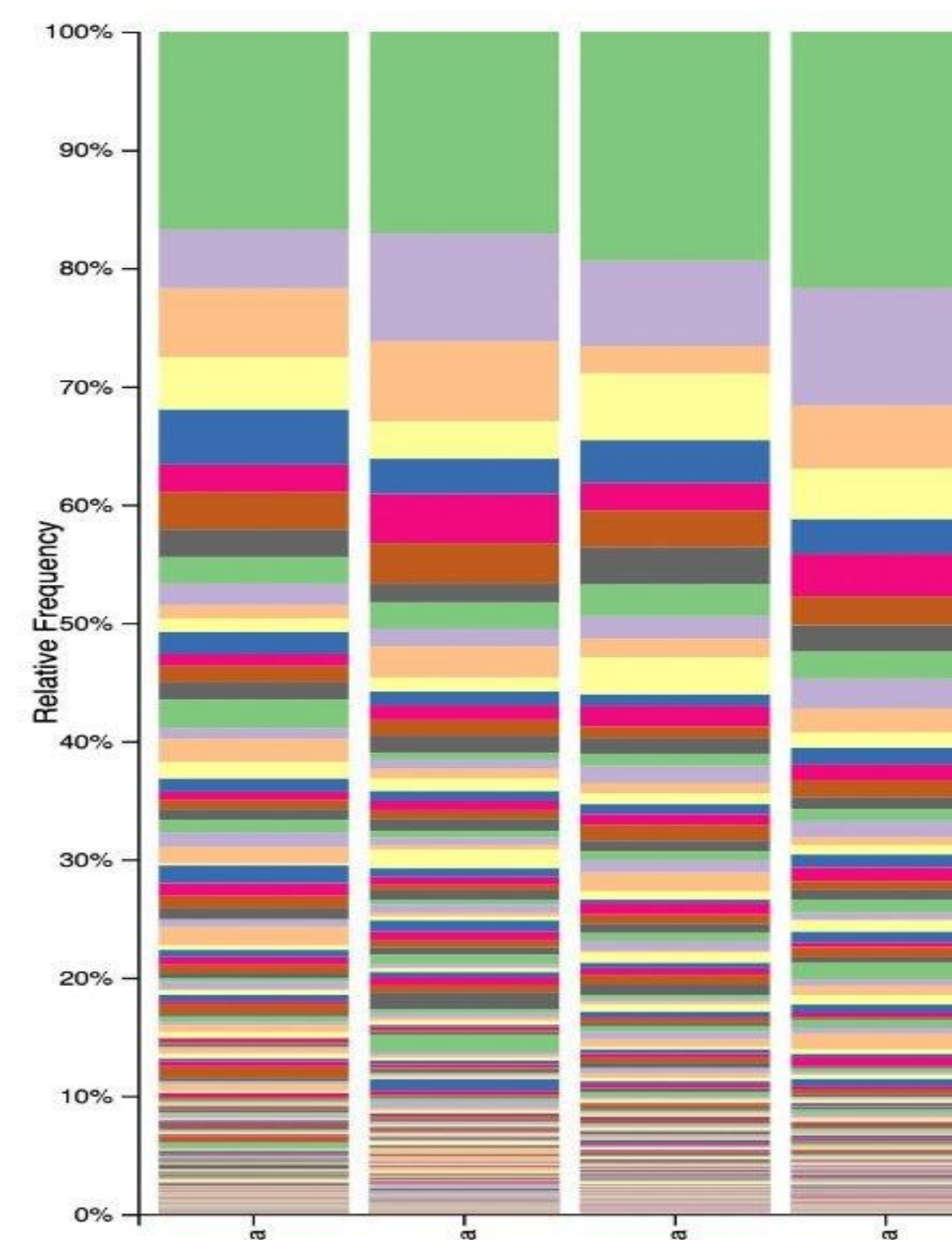


Figure 1: No significant differences in Shannon alpha diversity were observed between ACE inhibitor/ARB users and non-users in either the control or Alzheimer's disease groups.



Conclusion

- No overall gut microbiome diversity changes were associated with ACEi/ARB use in AD or controls.
- ACEi/ARB use was linked to selective gut microbial changes in AD, including decreased *Agathobacter* and increased *Bifidobacterium*.
- These findings suggest ACEi/ARB therapy may influence the gut-brain axis and could have potential as a microbiome-modulating strategy in AD.

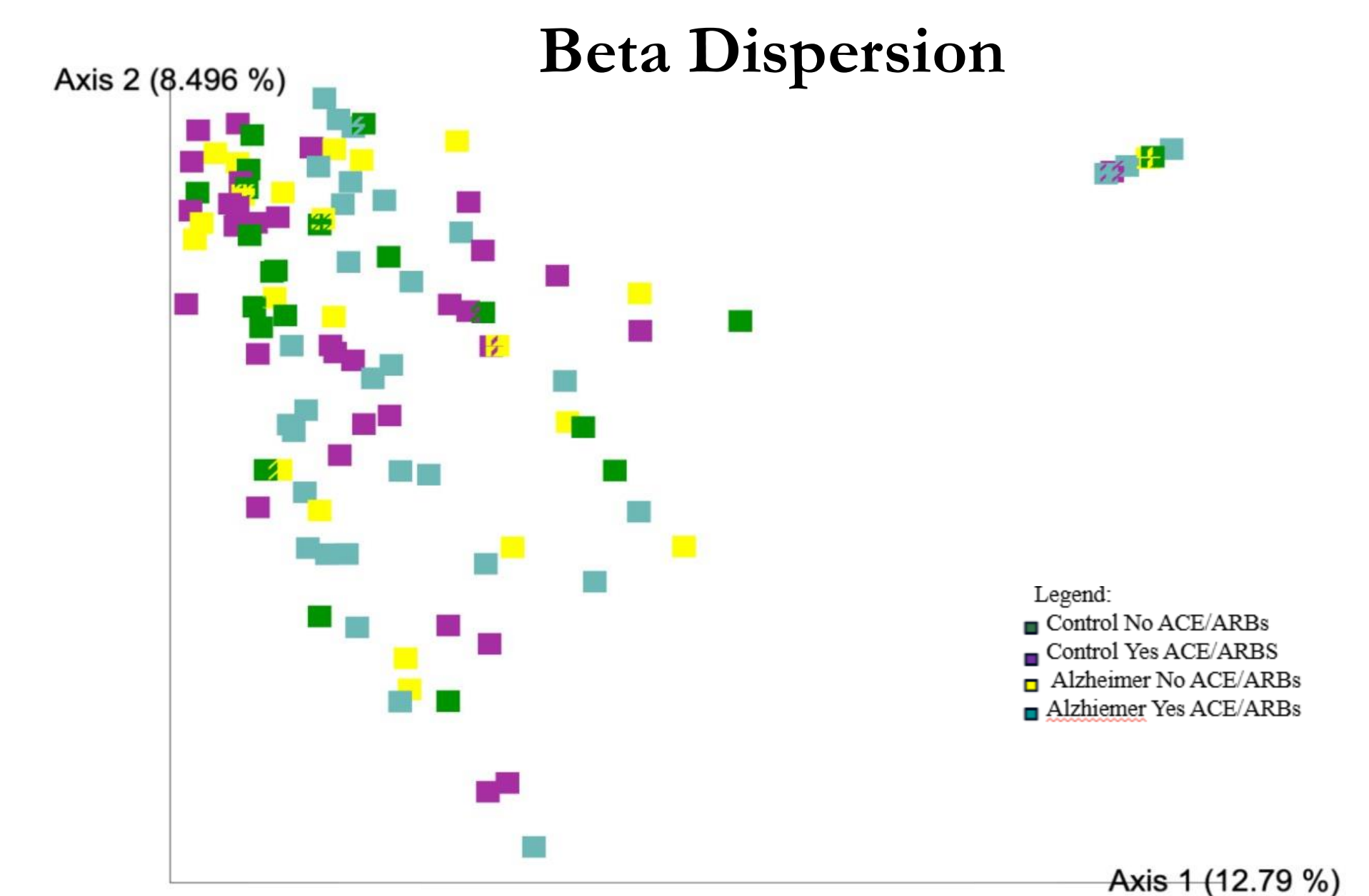


Figure 3: Bray-Curtis distance matrix depicts that microbiomes across AD and control patients that use or do not use ACE/ARBs have similar composition, but there is a high variability of microbial composition within each group. There is no statistically significant difference between the microbial composition amongst each group.

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