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What is the relationship between the Liver and heart health? A Mendelian Randomisation study using open cohort data

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1. Background

- Heart disease is one of the leading causes of death worldwide, and finding new ways to prevent it is crucial.
- We know that Alkaline phosphate (ALP), an enzyme in our blood, related to liver health, but it might also be connected to heart disease.
- Understanding this link could help us prevent heart disease more effectively.

2. Methodology

Where did we get the data from?

- We used large genetic studies that include information from 22,233 of people with heart disease and 64,762 controls.
- This allows us to compare those with naturally higher Alkaline phosphate (ALP) levels due to their genes to see if they are more likely to develop heart disease.

How did we analyse the data?

- We used a method called Mendelian Randomization (MR), which looks at how our genes influence different health factors.
- By studying the genes that affect Alkaline phosphate (ALP) levels, we can see if ALP is causing an increased risk of heart disease.

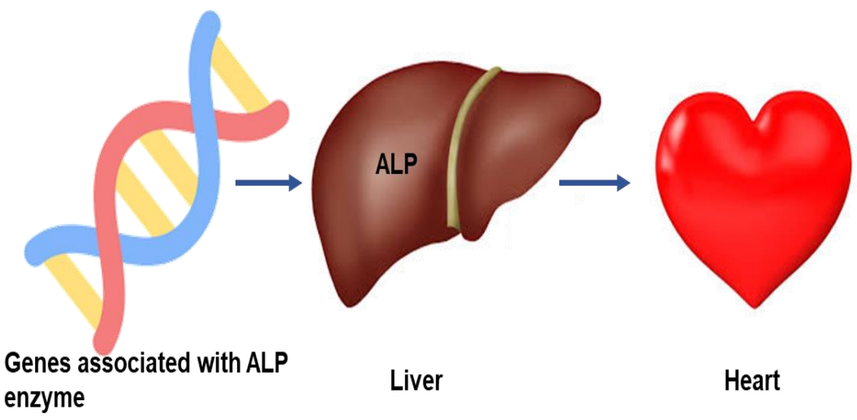

Figure 1: Diagrammatic illustration of establishing how ALP affects heart health *(Designed)*

References

- Pazoki, R. et al. Genetic analysis in European ancestry individuals identifies 517 loci associated with liver enzymes. Nat Commun 12, 2579 (2021).
- Schunkert, H et al. Large-scale association analysis identifies 13 new susceptibility loci for coronary artery disease. Nat Genet 43, 333–338 (2011)

3. Why did we use MR and how does it compare to Randomised control trial?

- Traditional observational studies are influenced by external factors like diet or lifestyle when establishing causality.
- But like Randomised control trial (RCT) which is the gold standard for establishing causality, MR can avoid these limitations and establish causality.

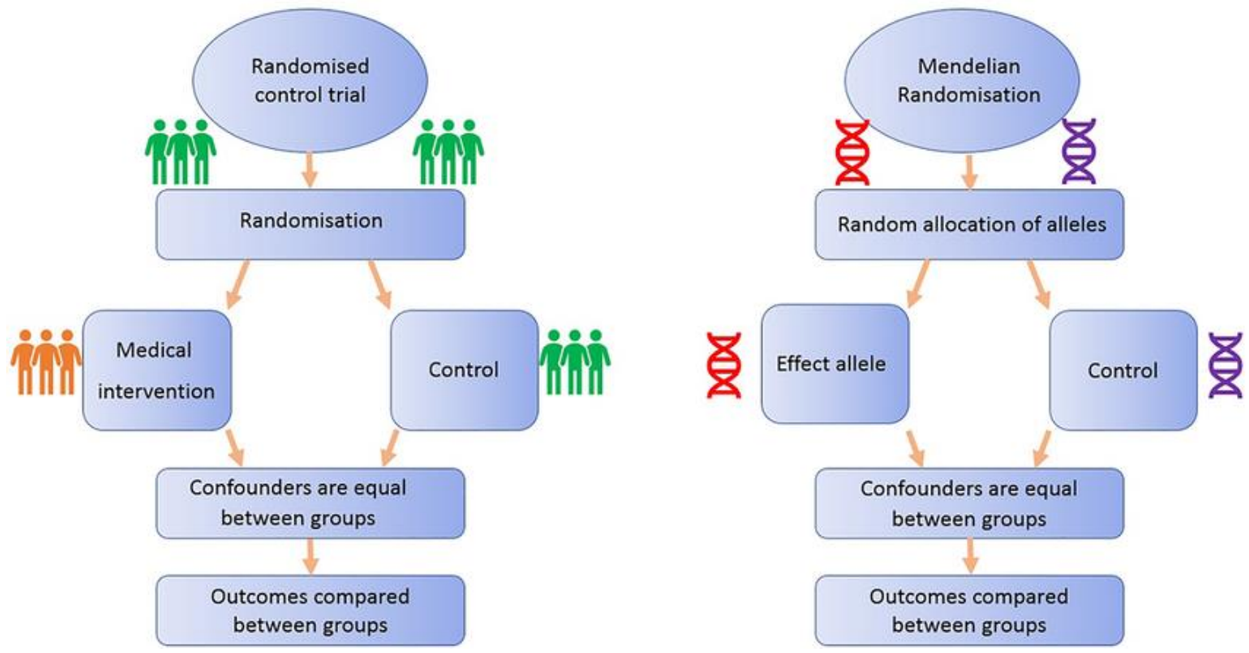

Figure 2: Illustration of Randomised control trial vs Mendelian randomisation. Source: Howel et al, 2018)

CORRELATION IS NOT CAUSATION

4. Result – What did we find?

- All five MR methods found no evidence of a causal relationship between ALP levels and heart health.

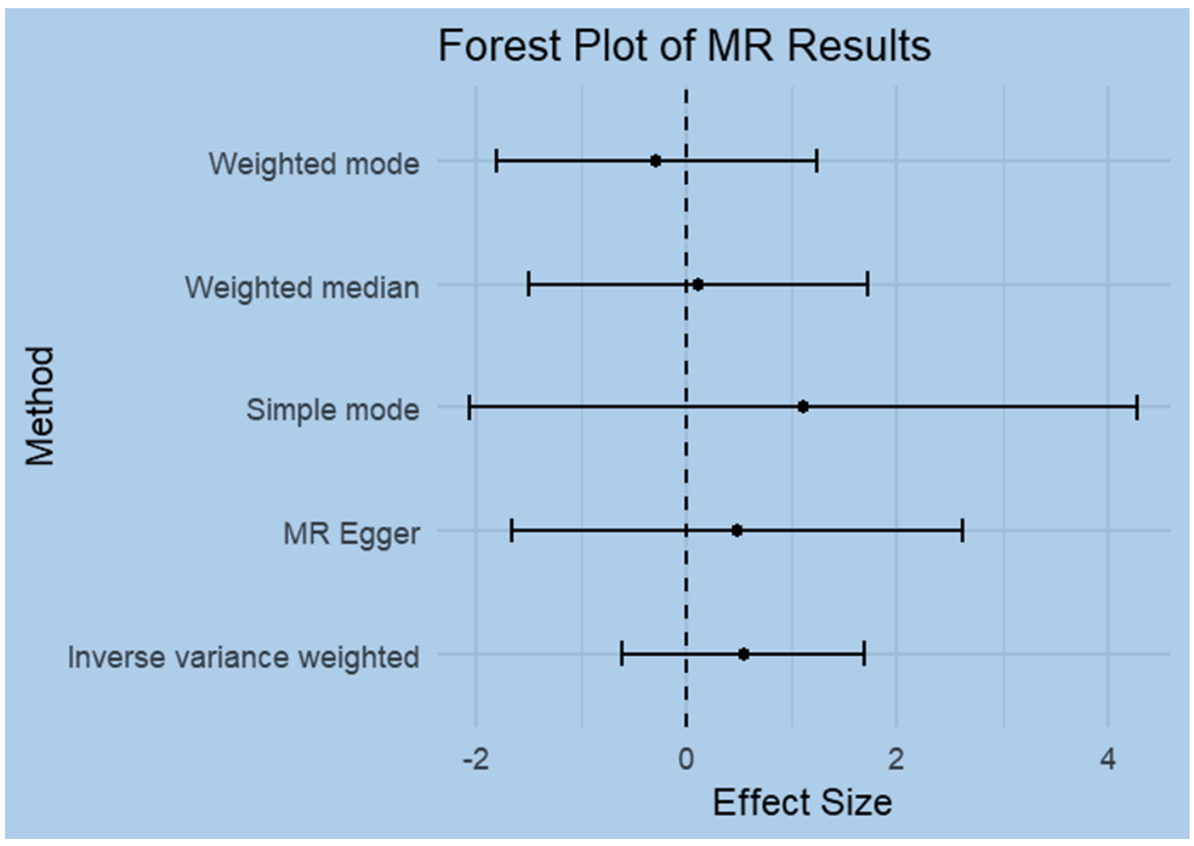

Figure 3: Visual representation of the MR result of ALP vs heart health

Why do these results matter?

- Without a clear causal link between ALP and heart health, resources can be focused on proven heart health risk factors like cholesterol and blood pressure.

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