



DNA METHYLATION AND EPIGENETIC AGEING IN POST-STROKE COGNITIVE IMPAIRMENT ACROSS AFRICAN AND EUROPEAN COHORTS

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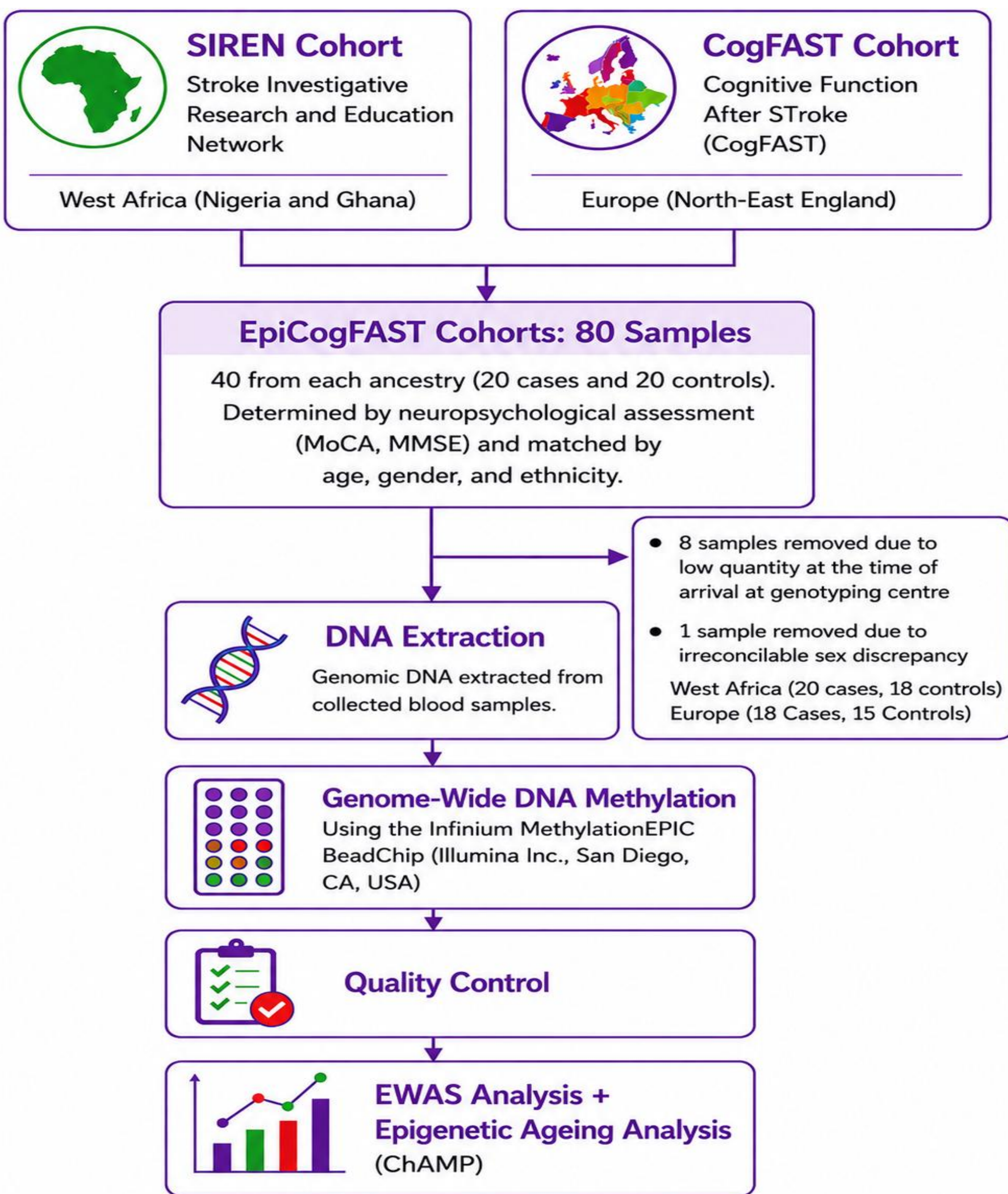


Post-stroke cognitive impairment exhibits ancestry-specific DNA methylation and epigenetic ageing patterns, highlighting the need for diverse populations in dementia research

BACKGROUND

- Vascular cognitive impairment and dementia (VCID) is a major contributor to the global dementia burden and frequently follows stroke.
- Cognitive outcomes are disproportionately poorer among people of African ancestry, yet the epigenetic mechanisms underlying post-stroke cognitive impairment (PSCI) remain largely unexplored in these populations.
- We examined ancestry-specific epigenetic signatures of PSCI and their relationship with biological ageing.

METHODOLOGY



RESULTS

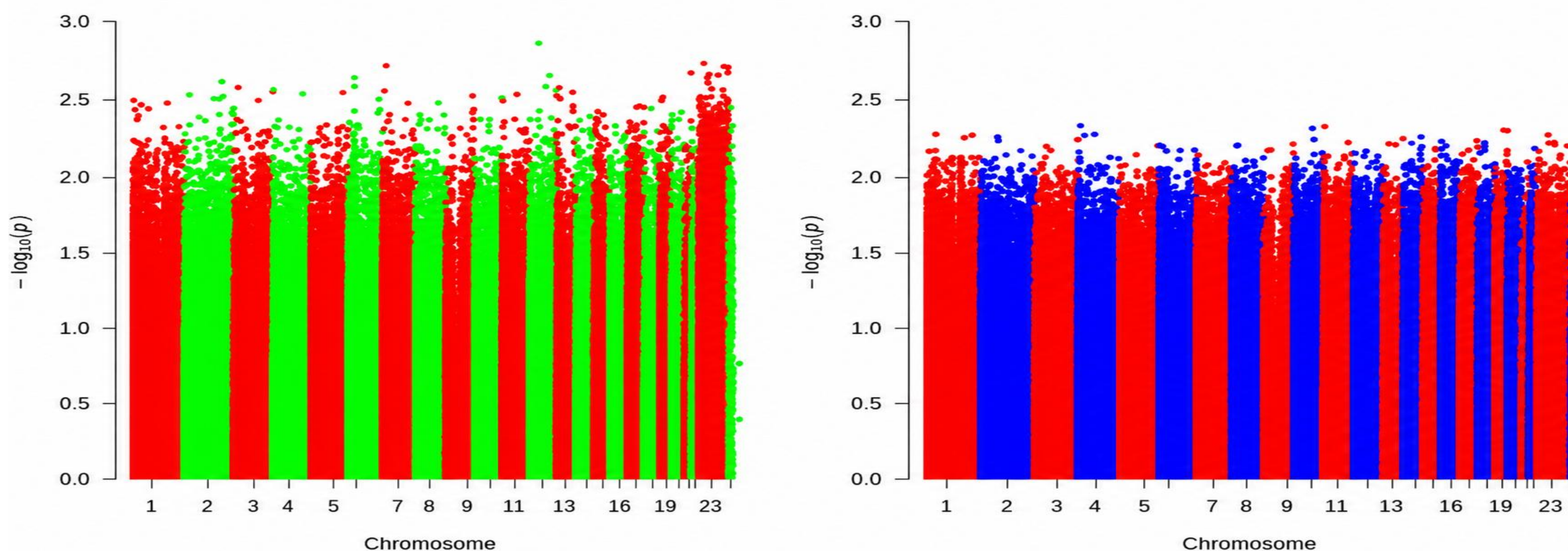


Figure 1: Manhattan plots for West African and European Cohorts respectively.

GO biological process	Homo sapiens-Reference list	Fold Enrichment	P-value	FDR
formaldehyde catabolic process (GO:0046294)	3	> 100	3.22E-05	0.049
peptide antigen assembly with MHC class II protein complex (GO:0002503)	16	75.71	1.92E-07	0.002
MHC class II protein complex assembly (GO:0002399)	16	75.71	1.92E-07	0.001
peptide antigen assembly with MHC protein complex (GO:0002501)	21	57.68	6.24E-07	0.003
MHC protein complex assembly (GO:0002396)	21	57.68	6.24E-07	0.002
antigen processing and presentation of exogenous peptide antigen via MHC class II (GO:0019886)	31	39.07	3.2E-06	0.009
antigen processing and presentation of peptide antigen via MHC class II (GO:0002495)	33	36.71	4.14E-06	0.011
antigen processing and presentation of peptide or polysaccharide antigen via MHC class II (GO:0002504)	34	35.63	4.68E-06	0.010
antigen processing and presentation of exogenous peptide antigen (GO:0002478)	41	29.54	1E-05	0.019
antigen processing and presentation of exogenous antigen (GO:0019884)	50	24.23	2.23E-05	0.038

Table 1: Significant results from GO Gene enrichment analysis for West African Cohort

- GO enrichment analysis identified significant enrichment of immune-related pathways, particularly MHC class II antigen presentation and assembly process (FDR < 0.05).
- Associations between epigenetic age and PSCI varied by ancestry; significant age $\times$ ancestry interactions were observed for all clocks except DunedinPACE.

CONCLUSION

- PSCI is characterised by distinct ancestry-specific DNA methylation profiles and differences in epigenetic ageing dynamics.
- These findings underscore the importance of ancestry-inclusive epigenetic research for improving the understanding of VCID and dementia risk

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