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Human Leukocyte Antigen Class I Supertypes and HIV-1 Control in African Americans

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ABSTRACT

The role of human leukocyte antigen (HLA) class I supertypes in controlling human immunodeficiency virus type 1 (HIV-1) infection in African Americans has not been established. We examined the effects of the *HLA-A* and *HLA-B* alleles and supertypes on the outcomes of HIV-1 clade B infection among 338 African American women and adolescents. HLA-B58 and -B62 supertypes (B58s and B62s) were associated with favorable HIV-1 disease control (proportional odds ratio [POR] of 0.33 and 95% confidence interval [95% CI] of 0.21 to 0.52 for the former and POR of 0.26 and 95% CI of 0.09 to 0.73 for the latter); B7s and B44s were associated with unfavorable disease control (POR of 2.39 and 95% CI of 1.54 to 3.73 for the former and POR of 1.63 and 95% CI of 1.08 to 2.47 for the latter). In general, individual alleles within specific B supertypes exerted relatively homogeneous effects. A notable exception was B27s, whose protective influence (POR, 0.58; 95% CI, 0.35 to 0.94) was masked by the

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opposing effect of its member allele B*1510. The associations of most B supertypes (e.g., B58s and B7s) were largely explained either by well-known effects of constituent B alleles or by effects of previously unimplicated B alleles aggregated into a particular supertype (e.g., B44s and B62s). A higher frequency of *HLA-B* genotypic supertypes correlated with a higher mean viral load (VL) and lower mean CD4 count (Pearson's $r = 0.63$ and 0.62 , respectively; $P = 0.03$). Among the genotypic supertypes, B58s and its member allele B*57 contributed disproportionately to the explainable VL variation. The study demonstrated the dominant role of *HLA-B* supertypes in HIV-1 clade B-infected African Americans and further dissected the contributions of individual class I alleles and their population frequencies to the supertype effects.

FOOTNOTES

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