

Supplementary Material

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1. Ethics Approval – Supplementary information

Participants gave written informed consent; for participants who did not have capacity to provide informed consent, written assent was obtained from a personal consultee for each individual following the approved protocol. All clinical and phenotypic information presented in the study was obtained through, and was within, the protocol approval from the Camden & Kings Cross Research Ethics Committee (11/LO/2016).

All genotypic information presented in this study has been approved by the Genomics England UK 100,000 Genomes Project Ethics Protocol and was made available for export from the GEL research environment through the Diagnostic Discovery system after successful submission of relevant approval forms through the Airlock system. Consent for publication of genotypic information for all participants and the connection of genotypic information to each participant's clinical information was obtained through, and was within, the protocol approval from the Camden & Kings Cross Research Ethics Committee (11/LO/2016).

2. **Supplementary Table 1:** Distribution of genotypes of 13 PGx polymorphisms of 8 genes in 46 *HLA-A*31:01* carriers with CBZ-induced cADRs and without CBZ-induced cADRs.

Polymorphism/Genotype	The <i>HLA-A*31:01</i> carriers exposed to the CBZ drug and had no rashes (n=37) (%)	The <i>HLA-A*31:01</i> carriers exposed to the CBZ drug and had rashes (n=9) (%)	RR (95% CI) *	Un-adjusted P-value†
<i>ABCB1:c.3435C > T(rs1045642)</i>				
<i>ABCB1:c.3435CC</i>	10(27.03%)	02(22.22%)	1.00 (Reference)	--
<i>ABCB1:c.3435CT</i>	19(51.35%)	05(55.56%)	1.25(0.28 - 5.52)	P=0.76
<i>ABCB1:c.3435TT</i>	08(21.62%)	02(22.22%)	1.20(0.20 - 7.05)	P=0.84
<i>ABCC2:c.-24C > T(rs717620)</i>				
<i>ABCC2:c.-24CC</i>	27(72.97%)	06(66.67%)	1.00 (Reference)	--
<i>ABCC2:c.-24CT</i>	09(24.32%)	02(22.22%)	1.00(0.23 - 04.25)	P= 1.00
<i>ABCC2:c.-24TT</i>	01(02.71%)	01(11.11%)	2.75(0.57 -13.13)	P= 0.27

ABCC2:c.1249G > A(rs2273697)				
ABCC2:c.1249GG	19(51.35%)	05(55.56%)	1.00 (Reference)	--
ABCC2:c.1249GA	15(40.54%)	03(33.33%)	0.80(0.21 - 02.91)	P= 0.73
ABCC2:c.1249AA	03(08.11%)	01(11.11%)	1.20(0.18- 7.77)	P= 0.85
ABCC2:c.3972C > T(rs3740066)				
ABCC2:c.3972CC	20(54.05%)	01(11.11%)	1.00 (Reference)	--
ABCC2:c.3972CT	12(32.43%)	07(77.78%)	7.73(1.04 - 57.24)	P=0.01†
ABCC2:c.3972TT	05(13.51%)	01(11.11%)	3.50(0.25 - 48.03)	P= 0.32
EPHX1:c.337 T > C(rs1051740)				
EPHX1:c.337TT	19(51.35%)	06(66.67%)	1.00 (Reference)	--
EPHX1:c.337TC	15(40.54%)	02(22.22%)	0.49(0.11 - 2.14)	P=0.32
EPHX1:c.337CC	03(08.11%)	01(11.11%)	1.04(0.16- 6.52)	P=0.96
SCN1A:c.603-91G>A(rs3812718)				
SCN1A:c.603-91GG	06(16.22%)	01(11.11%)	1.00 (Reference)	--
SCN1A:c.603-91GA	16(43.24%)	07(77.77%)	2.13(0.31 - 14.48)	P=0.39
SCN1A:c.603-91AA	15(40.54%)	01(11.11%)	00.43(0.03 - 06.04)	P=0.52
UGT2B7:c.802T>C(rs7439366)				
UGT2B7:c.802TT	05(13.51%)	01(11.11%)	1.00 (Reference)	--
UGT2B7:c.802TC	21(56.76%)	06(66.67%)	1.33(0.19 - 9.12)	P=0.76
UGT2B7:c.802CC	11(29.73%)	02(22.22%)	0.92(0.10 - 8.30)	P=0.94
UGT1A4:c.142T>G(rs2011425)				
UGT1A4:c.142TT	33(89.19%)	06(66.67%)	1.00 (Reference)	--
UGT1A4:c.142TG	04(10.82%)	03(33.33%)	2.78(0.90 - 8.61)	P=0.09
UGT1A4:c.142GG	00(00.00%)	00(00.00%)	--	--
EPHX1:c.416A>G(rs2234922)				
EPHX1:c.416AA	26(70.27%)	07(77.78%)	1.00 (Reference)	--
EPHX1:c.416AG	10(27.03%)	02(22.22%)	0.78(0.18 - 3.26)	P=0.73
EPHX1:c.416GG	01(02.71%)	00(00.00%)	--	--
CYP3A4:c.1026+12G>A(rs2242480)				
CYP3A4:c.1026+12GG	31(83.78%)	07(77.78%)	1.00 (Reference)	--
CYP3A4:c.1026+12GA	05(13.51%)	02(22.22%)	1.55(0.40 - 5.97)	P=0.53
CYP3A4:c.1026+12AA	01(02.71%)	00(00.00%)	--	--

UGT1A4:c.70C>T(rs6755571)				
UGT1A4:c.70CC	35(94.59%)	09(100.0%)	1.00 (Reference)	--
UGT1A4:c.70CT	02(05.41%)	00(00.00%)	0.74(0.03-16.91)	P=0.85
UGT1A4:c.70TT	00(00.00%)	00(00.00%)	--	--
UGT2B7:c.-26-2180T>C(rs7668258)				
UGT2B7:c.-26-2180TT	05(13.51%)	01(11.11%)	1.00 (Reference)	--
UGT2B7:c.-26-2180TC	21(56.76%)	06(66.67%)	1.33(0.19 - 9.12)	P=0.76
UGT2B7:c.-26-2180CC	11(29.73%)	02(22.22%)	0.92(0.10 - 8.30)	P=0.94
CYP2C19:c.1324C>T(rs192154563)				
CYP2C19:c.1324CC	37(100.0%)	09(100.0%)	1.00 (Reference)	--
CYP2C19:c.1324CT	00(00.00%)	00(00.00%)	--	--
CYP2C19:c.1324TT	00(00.00%)	00(00.00%)	--	--

Abbreviations: RR: Relative Risk; CI: confidence interval.

* RR and 95% CI were calculated with wild type genotype as reference group.

† P -Value less than 0.05 is significant.