Determining the effects of race, skin colour and genotype on the response to vitamin D therapy

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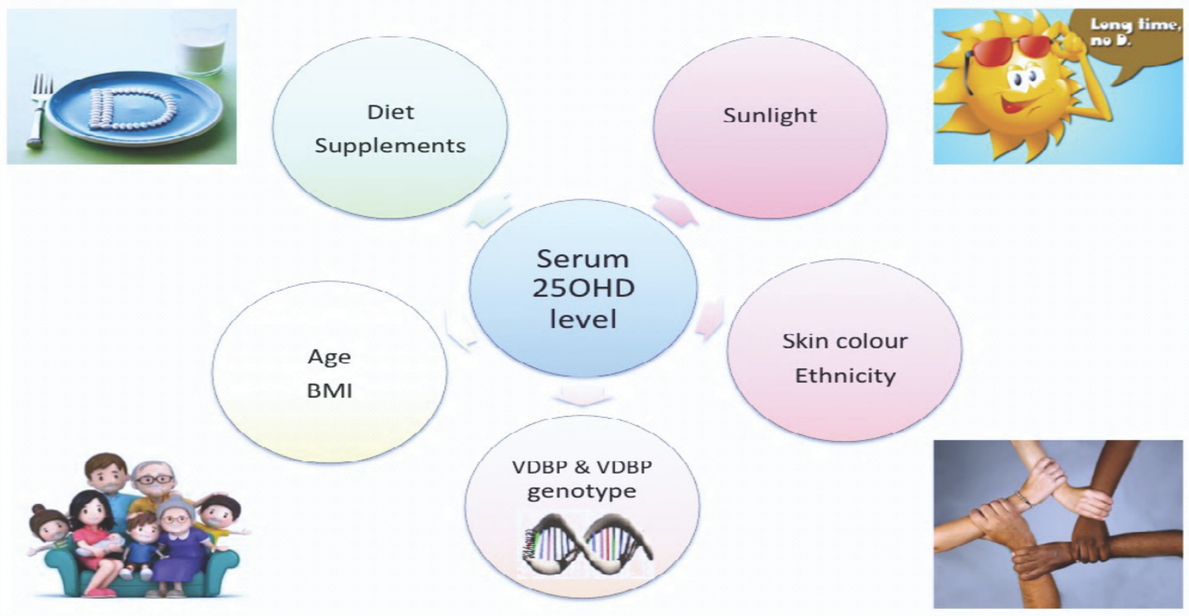
Background

Multiple factors influence vitamin D status in children and young people. It is unclear to what extent such factors influence the response to vitamin D treatment.

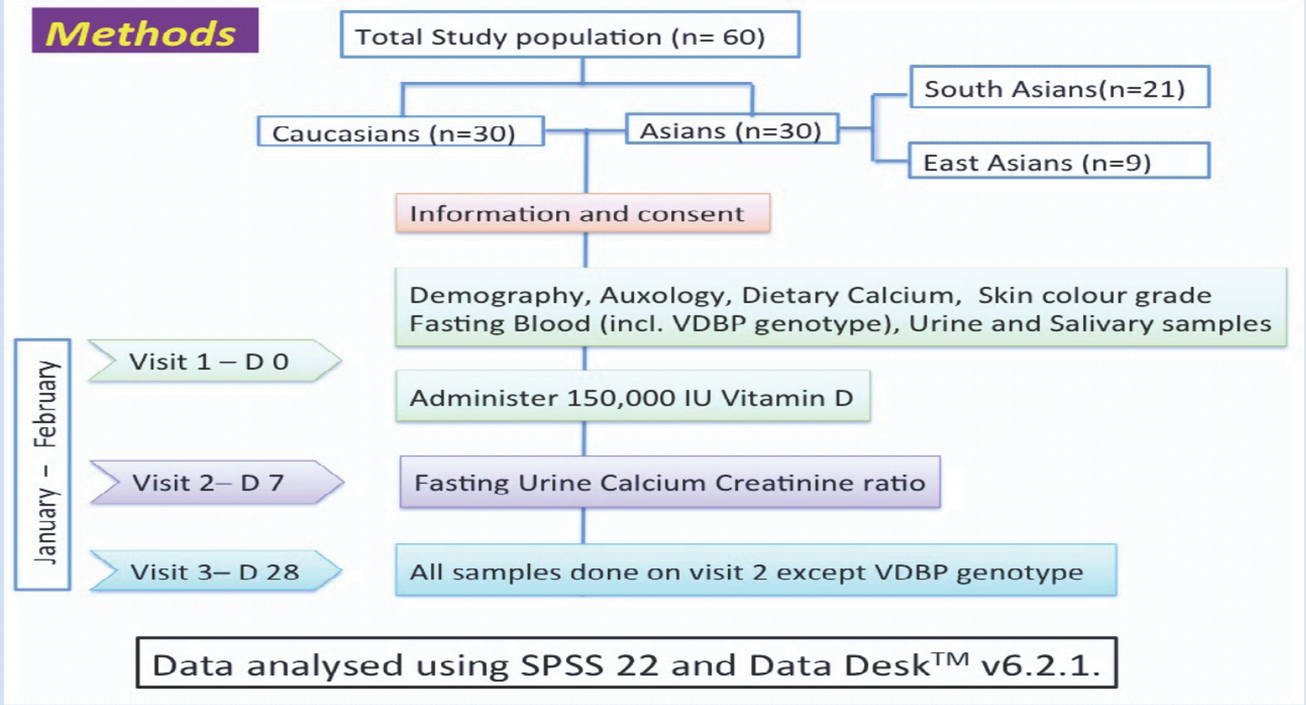
Aim

To investigate how skin colour, race and genetic variation affect the response to vitamin D (150,000 units) administered to young adults of White Caucasian & South /East Asian origin.

Influential factors

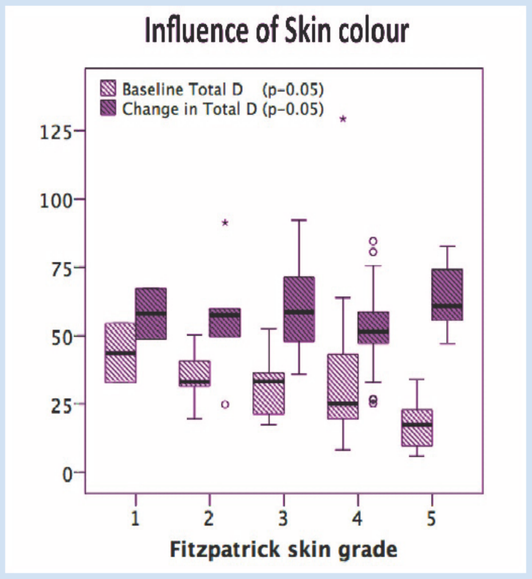


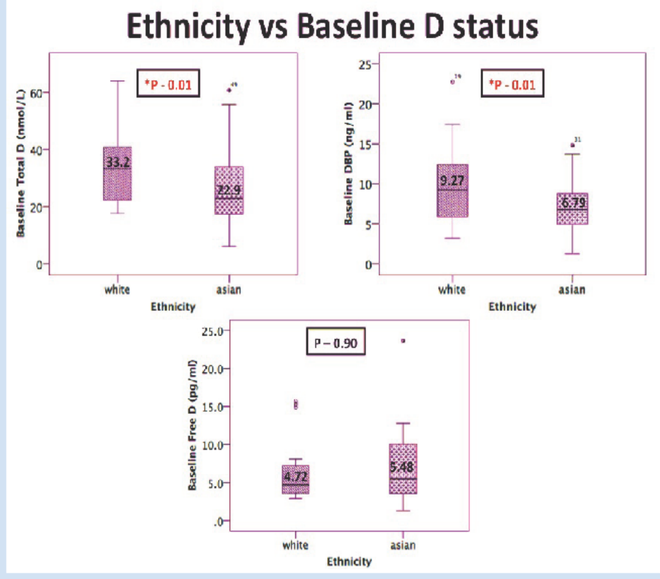
Methods

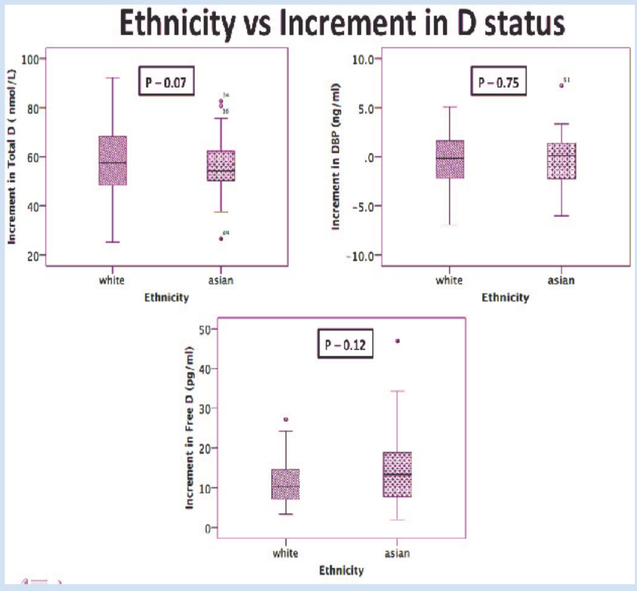


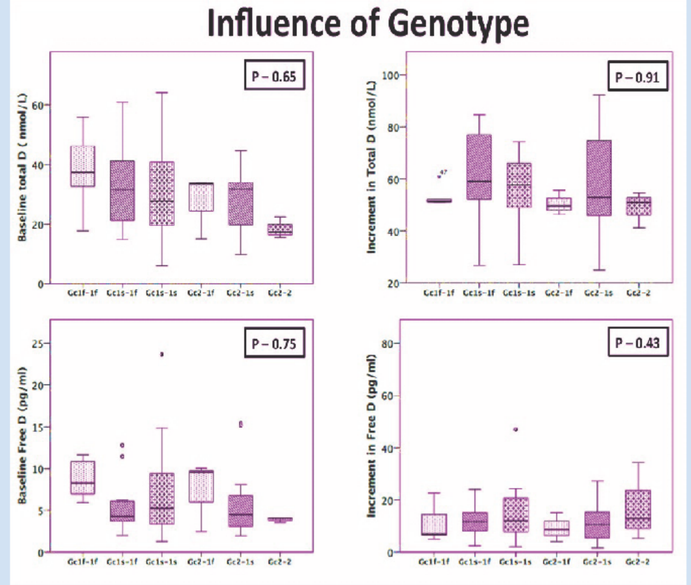
Results

Skin colour, race & VDBP genotype did not influence variation in treatment response as demonstrated by the graphs below.





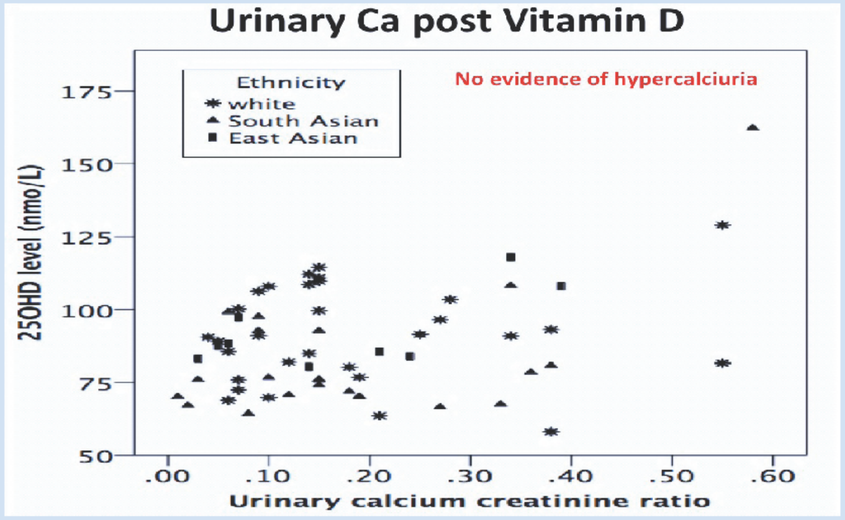




Asians had significantly lower serum 25OHD and VDBP levels at baseline but similar free and bioavailable 25OHD as whites. VDBP levels remained significantly lower in Asians post dosing with no difference in total or free /bioavailable 25OHD (table 1). All subjects achieved a ≥ 25nmol/L increment in 25OHD. No hypercalcaemia / hypercalciuria observed in any subject.

Table 1: Bone biochemistry and Turnover markers

	Serum Total 25OHD (nmol/L)	Serum VDBP (umol/L)	Calculated Free 25OHD (nmol/L)	Calculated Bioavailable 25OHD (nmol/L)	PTH (ng/L)	PINP (ng/ml)	CTX (ng/ml)
Baseline							* p-value <0.05
Whites	34.06(12.30)	6.59(3.03)	0.014(0.008)	0.015(0.007)	44.60 (14.24)	107.2 (40.90)	.82 (.26)
Asians	26.34(13.72)	4.73(2.27)	0.012(0.007)	0.020(0.010)	69.83 (38.62)	82.0 (36.72)	.68 (.21)
p value	*0.04	*0.01	0.37	0.26	*0.002	*0.002	*0.02
Post dosing							
Whites	90.79(16.71)	6.495(2.83)	0.037(0.018)	0.015(0.007)	49.37 (20.28)	113.83 (46.5)	.78 (.24)
Asians	82.79(14.04)	4.64(2.15)	0.04(0.02)	0.020(0.011)	65.16 (32.77)	92.3 (40.2)	.64 (.22)
p value	0.17	*0.008	0.47	0.16	*0.007	*0.025	*0.02



Conclusions

A single dose of 150,000 units of vitamin D is sufficient to increase the serum 25OHD by 50 nmol/L, irrespective of ethnicity, skin colour & genotype in young adult males.

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