Correction

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The following abstracts were presented at the Science and Medicine Meeting of the Royal College of Physicians and the Medical Research Society in November 1996 and were inadvertently omitted from Supplement 36, Clinical Science, Volume 92, 1997.

M50 KINETICS OF THE ERYTHROCYTE SODIUM-LITHIUM COUNTERTRANSPORTER (SLC) IN TREATED FAMILIAL HYPERLIPID AEMIAS (FH and FCH).

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Elevated SLC activity is independently associated with both hypertension and dylipidaemia. The association with hypertension is related to the affinity of the countertransporter for exteral Na (K_{Na}), while that with lipids is believed to be related to the transporters maximal turnover rate (V_{max}). However, the relationships noted between plasma lipids and V_{max} have been inconsistent, partly because the patient cohorts studied have often lacked homogeneity of full definition. We studied SLC activity, K_{Na} and V_{max} in 50 patients (35M/15F) with familial hypercholesterolaemia (FH), 30 patients (25M/5F) with familial combined hyperlipidaemia (FCH) and 50 healthy normolipidaemic controls (35M/15F) age and sex matched with the FH group. All the hyperlipidaemic patients were stabilised on combination drug therapy with a fibric acid derivative and a statin. Total cholesterol ($mmoll^{-1}$) was elevated in both FH and FCH as compared with controls (FH, 7.4±1.8; FCH, 8.1±3.4; controls, 5.6±1.1; $p<0.001$). LDL cholesterol ($mmoll^{-1}$) was raised in the FH only (FH, 4.9±1.7; FCH, 3.4±1.2; controls 3.0±0.7; $p<0.001$), while plasma triglycerides ($mmoll^{-1}$) were increased in the FCH only (FH, 1.8±1.0; FCH, 11.1±11.3; controls, 1.9±1.2; $p<0.001$). K_{Na} was unaltered in eithet FH or FCH. SLC activity and V_{max} were significantly reduced in the FH group compared to FCH and controls (Table).

	Control Group (n=50)	FH-Group (n=50)	FCH-Group (n=30)	p
SLC Activity (mmol Li/l RBC.h)	0.218 0.037 - 0.683	0.171 0.041 - 0.472	0.240 0.098-0.521	<0.01
K_{Na} (mmol)	65.2 5.9 - 290.9	50.9 13.2-209.3	57.9 9.8-112.3	NS
$Vmax^{\S}$ (mmol Li/l RBC.h)	0.361±0.175	0.269±0.141	0.364±0.178	<0.001

Results given as median [range] (Kruskall-Wallis) or mean±SD§ (ANOVA)

The finding that SLC activity and V_{max} are reduced in FH and normal in FCH contrasts with results from other groups who have noted elevations of these measurements in various dyslipidaemias. The feature distinguishing our FH and FCH groups is the elevated plasma triglyceride present in the latter. Since the reductions in SLC activity and V_{max} we have noted occurred in FH alone, where triglycerides were normal, this suggests that triglyceride elevation is not critical to the observed changes in the countertransporter. A possible explanation for our results may be the influence of drug therapy used in both our FH and FCH study groups; emphasising the need to characterise SLC in clearly defined dyslipidaemic states in the absence of therapy.

M51 INFLUENCE OF BUMETANIDE ON LITHIUM EFFLUX FROM THE HUMAN ERYTHROCYTE: IMPLICATIONS FOR CHARACTERISATION OF SODIUM-LITHIUM COUNTERTRANSPORTER (SLC).

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SLC activity represents leakage of lithium into an external 150 mM Na as compared to that into Na-free medium. Creation of kinetic progress curves permits estimation of maximal velocity (V_{max}) and exteranl affinity for sodium (K_{Na}). A component of Li leak is also mediated through the Na-K co-transporter. The extent of the contribution of this additional pathway is variable, can depend on the nature of the sodium substituent and may influence outcome of SLC analysis.

We investigated Li efflux in erythrocytes from 23 volunteers in absence and presence of bumetanide a specific Na-K co-transport inhibitor. Li loaded erythrocytes were incubated in 10 media of differing external [Na], range 0-150 mM. Efflux data were used to derive values for SLC activity, V_{max} and K_{Na}.

Li efflux at all 10 external [Na] were consistently lower in the presence of bumetanide ($p<0.05$). Bumetanide-sensitive Li efflux was inversely related to external [Na] in a log-linear manner ($r=-0.88$, $p<0.005$). The efflux values at either extreme of external [Na] were (mmol Li/l RBC.h): 0.028±0.063 [150 mM Na] vs 0.057±0.017 [0 mM Na]; $p<0.02$). Comparison of absolute values for SLC activity, V_{max} and k_{Na} showed no significant influence of bumetanide (Table). However, when correlations between data were examined, highly significant values were found for SLC activity and V_{max}, but not for K_{Na} (Table).

	(-) Bumetanide n=23	(+) Bumetanide n=23	Correlation
SLC Activity (mmol Li/l RBC.h)	0.289 [0.092 - 0.491]	0.287 [0.135 - 0.650]	r = 0.89* Slope =1.10
$V_{max}^{\S}$ (mmol Li/l RBC.h)	0.378 ±0.163	0.410 ±0.178	r = 0.84* Slope =0.92
k_{Na} (mM)	65.8 [29.5 - 175.0]	59.4 [6.0 - 134.8]	r = 0.10 Slope =0.07

Results expressed as Mean±SD§ or median [range]. *$p<0.0001$

This work shows that the component of Li efflux mediated by the Na-K co-transporter changes substantially with alterations in external [Na] that are used in the traditional SLC assay. This results in a variable contribution of a second transport pathway to the derived behaviour of SLC. To eliminate this variability, bumetanide should be included in all media when kinetics of SLC are studied.