BSS Plus compared to the vitreous of non-diabetics and diabetics

We thank Prof Sebag for the recent editorial[1] which provided a critical review of our paper 'Biochemical Analysis of the Living Human Vitreous'.[2] Our study reported the biochemical composition of vitreous obtained during macular hole repairs and epiretinal membrane peels, from both diabetic and non-diabetic individuals. Prof Sebag suggested that it would be interesting to compare the vitreous data from both the non-diabetic and diabetic subgroups to BSS Plus Irrigating Solution (Alcon, USA).[3] We have under- taken this subgroup analysis (Table 1).

It is known that BSS Plus does not contain a wide range of vitreous components, such as lactate, beta-hydroxybutyrate, copper, zinc, selenium, iron, transferrin and ferritin.[2]

This study indirectly assessed the composition of vitreous, using vitreous tissue extracted at the time of surgery, which was then frozen until analysis. Nevertheless, this provides the strongest evidence so far that solute concentration discrepancies of between 3.8% and 100% exist between human vitreous and the vitreous substitute BSS Plus.

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Table 1. Comparison of BSS Plus against vitreous biochemical data from non-diabetics and diabetics

	Current vitreous results									
	Diabetic Unpaired	Mean vitreous *i* (BSS Plus: *t*-test in BSS Plus		*Q*(*i*/*m*) status	Reported value (*m* = 16)	Difference concentration current data) (p-value)	Ratio of means between means (Alcon)			
Sodium (mmol/L)	Non-diabetic	147.5 = 15) (*n*		160	12.53 ± 0.8937	1.085	<0.0001	***	1	0.006 †
					14.25 ± 0.8539					
	Diabetic	145.8 = 12) (*n*		160	—0.9200 ± 0.2644	1.097	<0.0001	***	2	0.013 †
					—0.5000 ± 0.1642					
Potassium (mmol/L)	Non-diabetic	5.92 (*n* = 15)		5	7.533 ± 0.6752	0.845	0.0008	***	12	0.075 †
					9.417 ± 0.6450					
	Diabetic	5.50 (*n* = 12)		5	—0.2740 ± 0.1310	0.909	0.003	**	14	0.088 †
					0.0550 ± 0.1419					
Chloride (mmol/L)	Non-diabetic	122.5 = 15) (*n*		130	0.03667 ± 0.03919	1.061	<0.0001	***	3	0.019 †
	Diabetic	120.6 = 12) (*n*		130	0.1792 ± 0.03769	1.078	<0.0001	***	4	0.025 †
Calcium (mmol/L)	Non-diabetic	1.274 = 15) (*n*		1	2.573 ± 0.1742	0.785	0.0229	*	13	0.081 †
					1.350 ± 0.2572					
	Diabetic	0.945 = 12) (*n*		1	—3.602 ± 0.3144	1.058	0.351		16	0.100
					—4.433 ± 0.2042					
Magnesium (mmol/L)	Non-diabetic	0.963 = 15) (*n*		1	14.50 ± 1.708	1.038	0.1787		15	0.094
					16.42 ± 2.291					
	Diabetic	0.821 = 12) (*n*		1		1.218	<0.0001	***	5	0.031 †
Glucose (mmol/L)	Non-diabetic	2.43 (*n* = 15)		5		2.058	<0.0001	***	6	0.038 †
	Diabetic	3.65 (*n* = 12)		5		1.370	<0.0001	***	7	0.044 †

Lactate (mmol/L)	Non-diabetic	3.60 (n = 15)	0	0.000	<0.0001	***	8	0.050	†
	Diabetic	4.43 (n = 12)	0	0.000	<0.0001	***	9	0.056	†
Osmolality (mOsm/kg)	Non-diabetic	290.5 (n = 12)	305	1.050	<0.0001	***	10	0.063	†
	Diabetic	288.6 (n = 12)	305	1.057	<0.0001	***	11	0.069	†

*P < 0.05, **P < 0.01, ***P < 0.001. †Statistically significant after controlling for false discovery rate. i, P value rank; m, total number of significance tests (16); n, subgroup sample size; P, P value of independent-groups t-test; Q, false discovery rate (0.1); $Q(i/m)$, Benjamini–Hochberg critical value.

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