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Letter to the Editor: Composition of Seminal Fluid from Cystic Fibrosis Patients

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As the electrolyte abnormalities associated with exocrine glands have been measured and discussed at length, we have confirmed and extended the observed abnormalities in the male reproductive tract in this disease. We have measured the inorganic elemental composition of seminal plasma from five cystic fibrosis (CF) and five control volunteers by X-ray analysis (4). Excluding Cl, the concentrations of all elements assayed (Na, Mg, P, S, K, and Ca) were significantly different in the two groups. Immediately after collection, specimens were frozen and stored at −12°C. At the time of analysis, specimens were thawed and centrifuged to separate particulate matter. Microdroplet samples (10^{-10} liters) of the supernatant of the specimens were pipetted for energy dispersive X-ray analysis. Differences in concentrations were significant by Student's t test at the $P = 0.02$ level or less.

The results are consistent with available data on semen from both control (1, 3) and CF subjects (5). In addition to elements previously assayed in CF seminal fluid (5), we found that P concentration in CF semen is only about ⅕ that of controls whereas CF semen S concentration is about two-fold higher than in control semen. There was no significant difference in Cl concentration. From the data in Table 1, we concur with Rule *et al.* (5) that the principle differences in composition of CF seminal fluid are due to the absence of seminal vesicle secretory fluids in final semen. Consequently, CF semen composition is characterized by the composition of its major component, prostate secretions. The absence of seminal vesicle fluids is correlated with an anatomical discontinuity of the vas deferens and aspermia (2). Accordingly, we found that the inorganic composition of the seminal fluid of a known fertile CF subject was remarkedly similar to that of controls (Table 1).

In summary, although the elemental inorganic composition of CF seminal fluid is markedly different from control semen, the differences are well accounted for by assuming that the major component of the fluid is prostate gland secretion. There is little need to assume, as in most exocrine glands in CF, that fluid and electrolyte transport abnormalities are directly responsible for the alterations.

Table 1. *Comparison of concentrations of inorganic elements in CF and control semen*[1]

	Control semen		Composition of components			CF semen		
Element	x ± S.D.	Range	Final semen	Vesicle fluid	Prostate secretion	x ± S.D.	Range	Fertile CF semen
Na	122 ± 12	107–138	117	103	153	149 ± 17	136–178	120
Mg	2.5 ± 2.4	0–5.5	5.8			15.3 ± 4.4	10.6–22.5	1.4
P	47.1 ± 5.9	42.5–56.6	32	13	0.9	9.3 ± 4.8	6.5–17.7	40.8
S	7.7 ± 2.6	4.4–11.2				14.6 ± 4.7	9.8–21.9	8.4
Cl	38 ± 3.1	33–41	43		38	34 ± 8.1	24–48	28
K	33.7 ± 12.4	21–52	31	18	48	70 ± 4	58–39	31
Ca	7.5 ± 4.3	3.1–14.6	6.2	3.5	30	27 ± 12	17–47	5.8

[1] Concentrations (mM), standard deviations (S.D.), and ranges of measurements in this study are given for each of the elements listed at the far left. For comparison, values reported elsewhere for the components of normal semen and its major components are listed in the middle columns, and the composition of fertile CF semen is given at the extreme right.

REFERENCES AND NOTES

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