

## Letters

# Prostate-Specific Antigen in Cerebrospinal Fluid

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### *To the Editor:*

Improved, highly sensitive methods for measuring prostate-specific antigen (PSA) (1) have shown that PSA is present in many nonprostatic tissues and fluids (2). Briefly, studies indicate that PSA production in both physiological and pathological circumstances is not prostate- or sex-specific (3)(4)(5), but rather a steroid hormone-mediated response (6). PSA exists primarily in two immunoreactive forms: a ~33-kDa monomer (F-PSA) and a ~100-kDa complex with the protease inhibitor  $\alpha_1$ -antichymotrypsin (PSA-ACT). In studies involving ultrasensitive methodologies (detection limit of 1 ng/L PSA), >50% of the sera from women have detectable PSA concentrations (2)(7). Data indicate that the immunoreactive PSA in sera from women without breast cancer is complexed with ACT, whereas F-PSA predominates in sera from breast cancer patients (8). In this letter we report for the first time PSA presence in cerebrospinal fluid (CSF).

Ultrasensitive immunofluorometric PSA determinations in 299 CSFs from subjects with various neurological disorders indicated a positive result (>11 ng/L PSA) in 21 cases (7%). The age distribution of the subjects in this study was 3–79 years, with a mean of 42, SD of 13.60, and a median of 40 years. From the 20

PSA-positive cases for whom sex and age were known, 13 (65%) were in the highest age quartile (>49 years old), indicating that PSA positivity depended on patient age ( $\chi^2 = 6.789$ ,  $df = 1$ ,  $P < 0.010$ ). Eleven were of male origin, indicating no sex difference in positivity. The PSA concentrations in positive CSFs from men were not statistically different from those from women ( $P = 0.111$  for Mann–Whitney test). The following observations are also noteworthy: 6 of 129 (5%) with multiple sclerosis, 3 of 4 (75%) with cerebral vasculitis, 2 of 3 (67%) with myelopathy, and 2 of 6 (33%) with AIDS/HIV-associated neuropathic cases were positive for PSA. The third highest PSA concentration found in CSF from this study (132 ng/L) corresponded to a male patient with a pituitary neoplasm. PSA chromatographic profiles from four cases with high PSA in CSF revealed a variation with respect to the PSA immunoreactive subfractions. Specifically, the only PSA subfraction detected for a female case whose total PSA was the highest in this study (382 ng/L) was F-PSA (33 kDa). The other three cases, whose CSF was of male origin, had the PSA-ACT complex (100 kDa).

The limited diagnostic utility of most CSF biochemical analytes due to such variables as patient's age, blood–CSF barrier competence, and neurological disease states has been reviewed elsewhere (9). Our data are consistent with the proposal that PSA in the positive CSFs originated from brain tissue for three reasons. First, we found an equal number of positive CSFs among men and women. Spillover from serum is unlikely because men have about 500–1000-fold higher PSA serum concentrations than do women (8). Second, the PSA concentrations found in CSF are similar in men and women. Third, the highest PSA concentration was observed in the CSF of a woman with multiple sclerosis. The majority of our CSFs belonged to patients with multiple sclerosis, and in this group the PSA positivity was ~5%. Although the number of patients in the other categories is small, it is interesting that 3 of 4 patients with cerebral vasculitis, 2 of 3 patients with myelopathy, and 2 of 6 patients with HIV infection were positive.

This report further adds to the notion that PSA is a ubiquitous molecule and demonstrates that PSA may be produced by brain tissue. The role of PSA in CSF is currently unknown ([10](#))([11](#)).

## References

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