Journal of Andrology, Vol 13, Issue 6 571-578, Copyright © 1992 by The American Society of Andrology

JOURNAL ARTICLE

Human sperm acrosin. Further studies with the clinical assay and activity in a group of presumably fertile men

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The goals of this study were to determine the effect of the nonionic detergent, Triton X-100, on the recovery of acrosin in the clinical assay (Kennedy et al, 1989), since previous investigations have used higher concentrations for acrosin extraction from spermatozoa; and to establish the minimal acrosin activity in fertile men. The recovered acrosin activity was dependent on the concentration of Triton. A peak in acrosin activity was obtained at 0.01% to 0.02% Triton, the approximate critical micelle concentration (CMC; 0.015%). The bimodal effect of Triton was not due to substrate/buffer alterations, to the degree of acrosomal disruption as assessed by light and transmission electron microscopic examination, or to its effect on the kinetic properties of acrosin, as determined by spectrophotometric analysis of acid-extracted enzyme. However, Triton affected the conversion of proacrosin to acrosin, with peak activation occurring at 0.01% to 0.02% detergent. The acrosin activity of a group of presumably fertile men (as established by the production of offspring under natural conditions) varied from 18 to 42 microIU/10(6) spermatozoa, as assessed by the clinical assay containing 0.01% Triton. Furthermore, men who had initial acrosin values in the low normal range (18 to 25 microIU/10(6) sperm) were observed for 11 months. The acrosin activity of their ejaculates never fell below 17 microIU/10(6) sperm. Thus, it can be tentatively assumed that the minimal levels of acrosin for naturally fertile men are 17 to 18 microIU acrosin/10(6) sperm in this assay.