Journal of Andrology, Vol 21, Issue 2 262-267, Copyright © 2000 by The American Society of Andrology

JOURNAL ARTICLE

Factors involved in the biochemical etiology of human seminal plasma hyperviscosity

G. Mendeluk, F. L. Gonzalez Flecha, P. R. Castello and C. Bregni

Departamento de Bioquimica Clinica, Facultad de Farmacia y Bioquimica, Universidad de Buenos Aires, Argentina. fliagobeter@ciudad.com.ar

Semen rheology was studied to elucidate the biochemical basis of seminal plasma hyperviscosity. Semen proved to fit in with a power law model, by presenting a pseudoplastic behavior. Apparent viscosity at 230 s(-1) and 25 degrees C (eta(a)) was 4.3 /- 0.2 cp and 5.4 +/- 0.4 cp in normal and high-consistency semen, respectively. The effect of enzymes and mucolytic agents on human seminal plasma viscosity were evaluated by incubating normal and hyperviscous semen pool aliquots with trypsin, dithiothreitol, EDTA, alpha-amylase and deoxyribonuclease I. After incubation, trypsin treatment reduced eta(a) by 36% in normal semen and by 44% in hyperviscous semen. There was a decrease in eta(a) following incubation of hyperviscous samples with dithiothreitol (33%) and alpha-amylase (44%) that was not observed in the normal consistency samples. No decrease was observed in eta(a) after EDTA or DNAse treatment of both groups. Comparison of normal and hyperviscous seminal plasmas revealed no difference in the concentration of total proteins, DNA, or in the percentage of water content. These findings indicate that the primary substances responsible for basic normal semen rheologic behavior are proteins. A comparison of rheological properties between normal and hyperviscous semen samples indicates the existence of a highly organized network in the latter group, in which disulfide bonds and oligosaccharide chains complexed to the peptide core may play a key role.

This article has been cited by other articles:

Journal of ANDROLOGY

S. Rijnders, J. G. M. Bolscher, J. McDonnell, and J. P. W. Vermeiden

Filling Time of a Lamellar Capillary-Filling Semen Analysis Chamber Is a Rapid, Precise, and Accurate Method to Assess Viscosity of Seminal Plasma

J Androl, July 1, 2007; 28(4): 461 - 465.

[Full Text] [PDF]