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Quantification of Seminal Plasma Motility Inhibitor/Semenogelin in Human Seminal Plasma

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Semenogelin I and II (Sg I and II) are the major components of human semen coagulum. The protein is rapidly cleaved after ejaculation by the chymotrypsin-like protease prostate-specific antigen (PSA), which results in the liquefaction of the semen coagulum and the progressive release of motile spermatozoa. One of the cleavage products of the protein, a 14-kDa protein, is a sperm motility inhibitor (seminal plasma motility inhibitor [SPMI]). We developed a monoclonal antibody (mAb) that is specific to the fragment of Sgs, SPMI, and a sandwich enzyme-linked immunosorbent assay (ELISA) system for the quantification of Sgs using this mAb. Then, we measured SPMI/Sg levels in human seminal plasma from healthy male volunteers (n = 100, aged 18-24 years). The mean level of SPMI/Sg in seminal plasma was 19 ± 13 mg/mL (range, 4-68 mg/mL). Log-transformed SPMI/Sg levels were negatively correlated with the sperm motility ($r = -0.229$, $P = .0220$) and positively correlated with the total protein concentration ($r = 0.793$, $P < .0001$). This result supports that SPMI, one of the fragments of Sg, has its inhibitory effect on ejaculated spermatozoa in liquefied semen under physiological conditions.

Key words: Sperm motility inhibitor, seminal vesicles, asthenozoospermia

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