

SUMMARY AND CONCLUSION

Seminal plasma plays an important role in the process of reproduction other than serving as the vehicle for the transport of spermatozoa. In spite of this, the chemical mechanisms by which the components of seminal plasma regulate the functional properties of human spermatozoa remain unresolved.

This study was performed on spermatozoa in whole washed and non-washed ejaculates and in fractions of split ejaculates, in fresh specimens and after periods of incubation in the hope that it may throw some light on these mechanisms. Effects of calcium and ascorbic acid on sperms were also studied. All specimens were examined histochemically for adenosine triphosphatase, lactate dehydrogenase, succinic dehydrogenase, non-specific esterase, PAS reaction and Sudan black B. One hundred sperms were evaluated for each staining reaction in every specimen. The number of sperms with different grades of reaction was determined. Semen examination was done macroscopically and microscopically for sperm count, motility and morphology. Biochemical analysis for zinc and fructose (as markers of the prostatic and seminal vesicle secretions respectively) was also done.

The results of the present study showed new aspects of the seminal plasma support to spermatozoa such as improved ATP hydrolysis, glycolysis, tricarboxylic acid cycle (Krebs cycle) and non-specific esterase activity and preservation of the lipid component of sperms and structural glycoproteins.

The first half of the split ejaculates consisting mainly of prostatic secretions showed higher adenosine triphosphatase, lactate dehydrogenase, succinic dehydrogenase and non-specific esterase activities than those in the corresponding whole non-washed

ejaculates. On the other hand, the second half of the split ejaculates consisting mainly of seminal vesicle secretions showed lower activities than in the corresponding whole non-washed ejaculates.

Calcium was shown to have a stimulatory effect on adenosine triphosphatase activity [energy consumption] followed by an increased lactate dehydrogenase activity [glycolysis] and decreased PAS reaction [decreased glycogen content] caused by the increased glycolysis.

Improvement of ATP hydrolysis, glycolysis, tricarboxylic acid cycle (Krebs cycle) and non-specific esterase activity and preservation of the lipid component of sperms were noted with addition of ascorbic acid to washed samples examined after incubation. This may be attributed to the reductive properties of ascorbic acid. So, it may nullify the possible spermicidal effect of toxic free radicals resulting from cellular metabolism.

Addition of ascorbic acid to the first fraction of split ejaculates showed more improvement of ATP hydrolysis, glycolysis, tricarboxylic acid cycle (Krebs cycle) and non-specific esterase activity, decrease of the PAS reaction and preservation of the lipid component of sperms

These observations supported the use of the first fraction of a split ejaculate and addition of calcium in cases of artificial insemination with the husband's semen for oligoathenospemia and also in in-vitro fertilization.

These results suggested also the importance of ascorbic acid addition to the insemination media in order to preserve the viability of the sperms in the previous techniques.