SUMMARY AND CONCLUSIONS

In the last few years, extensive investigations have been conducted on the value of sperm hypo-osmotic swelling test as a measure of the fertilizing capacity of the spermatozoon.

Evaluation of the hypo-osmotic swelling test was done by many investigators in comparison to zona-free hamster ovum penetration test. Some of them found a good correlation between these two tests but others could not demonstrate any significant correlation between the ability of sperm to swell in the hypo-osmotic condition and the ability of sperm to penetrate zona-free hamster ova in vitro.

In this study acrosin activity assay of the spermatozoa was chosen as a substitute to zona-free hamster ova penetration test in evaluation of the hypo-osmotic swelling test. Why did we choose the acrosin activity?. This is for many reasons:-

1- Many studies that were performed on the role of this enzyme in the process of fertilization suggested that acrosin is the enzyme responsible for penetration of the sperm through the zona pellucida of the oocyte.

2- The denuded hamster egg test does not always reflect the ability or inability of spermatozoa to fertiliza intact human oocyte.

3- The assay of acrosin activity is a simpler less time consuming and less expensive procedure for studying the potential fertilization capacity of spermatozoa. On the other hand zona-free hamster ova penetration test is more expensive time consuming and requires a great experience.

This study has been carried out on 61 infertile patients and 10 normal fertile men. They were subjected to the following:

1- Selected case history taking.

2- Thorough clinical examination.

3- Routine semen analysis.

4- The hypo-osmotic swelling test.

5- Spectrophotometrical determination of acrosin activity in their spermatozoal acid extracts.

In addition sperm acid extracts from 9 infertile patients were reassayed for acrosin activity after adding to the assay cuvette 0.05 ml 10 mM CaCL2 to show the effect of CaCL2 on convertion of proacrosin to active acrosin.

Also, three cases out of these infertile men were studied by electron microscopy; they showed decreased percentage motile sperm than normal inspite of high percentage of swollen sperm i.e. more than 50%.

The results obtained were tabulated and discussed and they

between the percentage of swollen sperm and percentage of abnormal forms in this study. This means that abnormal forms do not necessarily have an abnormal membrane integrity but some have an intact membrane that permits swelling in the hypo-osmotic swelling solution.

(10) When CaCL2 in a molar concentration was added to sperm acid extracts of 9 infertile ejaculates, there was statistically significant increase in acrosin activity. This means that most of acrosin is present in the inactive proacrosin form.

can be summarised in the following observations:

(1) The sperm swelling test is not a replacement for semen analysis. In fact the two tests are complementary as the swelling test is a new parameter of the fertility status which can not be measured by semen analysis.

(2) The sperm swelling test is an economic and easy one. It can readily be performed in any clinical setting.

(3) There is a positive significant correlation between the swelling test and acrosin activity in the fertile group and also in the infertile group with normozoospermia but this significant correlation is absent in the other infertile groups.

(4) The result of swelling test is significantly higher in the fertile control group than the infertile groups, while there is a controversy in the result of acrosin activity. It is higher in the fertile group than the infertile group with normozoospermia and asthenozoospermia but not in the other infertile groups.

(5) Although the assay of acrosin activity is simpler, less time consuming and less expensive than the hamster ova penetration test, both are still showing a controversy in their relation with the hypo-osmotic swelling test. This indicates that all of them are complementary to the standard semen

analysis and each of them measures different entities. The hypo-osmotic swelling test measures the functional integrity of the membrane of human sperm, while the acrosin activity assay measures the capacity of the sperm to penetrate the zona pellucida of human ovum and the hamster ovum penetration test measures the capacity of the sperm to penetrate zona-free ovum.

(6) There is a significant positive correlation between the swelling test result and the percentage of active motile sperm in all groups studied. This means that the spermatozoon to be motile it probably requires a biochemically intact plasma membrane.

(7) The electron microscopic study indicates that motility of the spermatozoon does not only depend on its membrane integrity but many other defects may be responsible for the decreased motility.

(8) The correlation between sperm swelling and motility was greater when the percentage of sperm swelling was < 50%. At low percentage swelling, sperm motility would certainly be impaired but at a high percentage swelling, sperm motility may be good or impaired by other defects as was shown by electron microscope. So swelling test can diagnose infertility but can not ensure that the man is fertile.

(9) A negative but non significant correlation was found