The success of any infertility management programme is reflected in its efficacy to achieve a pregnancy either spontaneously or through assistance. For this purpose some routine investigations are carried out to pinpoint the nature of problem(s) which an infertile couple is trouble with. As the basic requisite for conception to occur is the accumulation of motile spermatozoa around the egg at the site of fertilisation, proper assessment of sperm transit from the vagina to the tubal ampulla becomes a very important criterion to predict the possibility of spontaneous pregnancy. Till date postcoital test was the sole investigative tool available to serve this purpose but unfortunately it fails to furnish any information about the concentration and nature of quality of spermatozoa beyond the cervix. This results in the disparity between postcoital test results and pregnancy outcome. In the present study intra-uterine fluid was examined along with cervical mucus 4-6 hours postcoitus in the pre-ovulatory period. The objective was to gather information about the fate of spermatozoa subjected to the uterine environment after being vaginally deposited during coitus. The results of this combined test has been found to very much informative and helpful for the fertility physician to set the criteria for timed intercourse and/or inter-uterine insemination. This simple test thus appears to play a leading role in infertility management in near future.

Key words: Infertility Management, intra-uterine aspirate, intra-uterine insemination, spontaneous pregnancy, timed intercourse.

The occurrence of a natural pregnancy depends on concentration of healthy motile spermatozoa around the egg in the fallopian tube. To achieve this, vaginally deposited spermatozoa following coitus must penetrate through the cervical mucus to enter the endometrial cavity on their way to the tubal ampulla. The cervical mucus being the route of sperm enter from the vaginal environment into the upper genital tract acts as a regulator and filter of sperm transport. Significant reduction in sperm concentration and alteration in their motility occur along this pathway. So far there was no good criterion to access the sperm transport except postcoital test (PTC) whereupon it is assumed that the presence of satisfactory number of motile spermatozoa in the cervical mucus as is found in a good PTC ensure good concentration of sperm cell in the uterine cavity and thereby in the fallopian tubes. For long PTC has been considered of fertility evaluation. But in actual practice, however, the correlation between the PTC results and corresponding pregnancy outcome proved to be very poor due to the test’s lack of validity which has given rise to mush of controversy. To alleviate this we were trying to find out some supportive factor that when combined with PTC results would be more informative in this regard.

The present report documents the efficacy of our combined PTC intra-uterine aspirate (IUA) – cervical mucus (CN) study in relation to its predictive of corresponding pregnancy outcome.
From July 2000 to June 2003 we had performed microscopic observation of IUA and PTC for 375 women between 20 and 35 years of age attended for infertility. These patients mostly had tubal patency confirmed beforehand except few very young patients below the age 23 who had the test even before the tubal patency was performed according to RCOG guideline attending the clinic for infertility problem. Only those patients who exhibited similar results for at least two consecutive PTC-IUA examinations over a period of 3-6 month were included in the study. In all patients ovulation was stimulated with either clomiphene citrate or with clomiphene citrate and human menopausal gonadotrophin (hMG) and follicular maturation was monitored ultrasonographically from 7 onwards. The patients were advised to have intercourse the day follicles were found become 19-20mm in diameter and cervical mucus insler scoring was in between 8 and 12cm, which mucus is suitable for sperm transport. The couples were suggested to have coitus in the early morning, and the test was performed 4-6 hours later. It was also suggested that they abstain from intercourse 48 hours prior to PTC and IUA. For PTC vaginal fluid (0.3-0.4) was collected in saline with an intra-uterine insemination (IUI) canula and cervical mucus (0.2-0.3ml) was collected from endocervical canal with a nasal polyp forcep or a tuberculin syringe. Next 2-9 ul of uterine fluid was aspirated with the help of an IUI catheter/canula. Care was taken not to allow any accidental aspiration of the mucus from the higher part of the cervical canal. To serve the purpose negative pressure was created inside the catheter with a 10ml syringe, the catheter was rotated 360° and manipulated inside little bit of up and down to cover cavity. Before taking the catheter out the suction was put off such that no cervical mucus could contaminate the uterine aspirate. The fluids were examined under light microscope in 400 times magnification. Results were interpreted with respect to IUA and depending on the results the patients were classified into two broad group visibly, good IUA and poor IUA, to each of which belonged three subclasses eg, good PTC, fair PTC and poor PTC.

Interpretation of the results was based on the following classification in accordance with the guidelines provided by WHO and the American fertility society.

Good IUA -> 10AMS/hpf
Poor IUA - < 10AMS/HPF
Good PCT - ≥ 25AMS/hpf
Fair PCT - 10-24AMS/hpf
Poor PCT - < 10AMS/hpf

(AMS – actively motile sperm) (hpf – high power field)

There were 147 pregnancies out of 375 cases examined, the pregnancy rate (PR) being 39.20%. Fifteen cases were present in the good IUA- good PCT group who were advised timed intercourse (TI) and three of them conceived leading to a PR of 20%. During this study, we did not come across any patient exhibiting good IUA- fair PCT. So this group was not included in this report. There were only 5 patients in good IUA – poor PCT group. No pregnancy was established in this group so far. Sixty–six patients belonging to poor

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<th>IUA groups</th>
<th>No. of cases</th>
<th>No. of Pregnancy</th>
<th>Pregnancy rates (%)</th>
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<td>Spontaneous</td>
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Table 1- Spontaneous and IUI Pregnancy Rates of Patients Belonging to Different Subclasses under IUA Groups
IUA – Good PCT group resulted in 42 pregnancies (63.63% PR) all of which were spontaneous. No conception followed the 9 cases of IUI carried out in this subclass. Poor IUA – Fair PCT group consisted of 51 patients of which 18 conceived following TI; 15 patients of this group who underwent IUI did not produce any pregnancy. This group thus exhibited 35.29% PR. The largest number of patients viz, 238 were present in the poor IUA-poor PCT category of which 90 underwent IUI resulting in 42 pregnancies, the rate being 46.66% of the 84 pregnancies in this group the rest 42 were spontaneous ones. Thus the normal PR is 17.64% in the poor IUA-poor PCT group (table 1 & Fig 1).

Comments:

(Graph)

It has long been observed that the rate of IUI is poor even in best hands, the overall success rate being 15-20% per cycle worldwide\(^5\). In many occasions IUI is performed where indication is unexplained infertility. This poor rate is because of improper selection of cases. The observation in that intra-uterine sperm concentration in peri-ovulatory period is satisfactory and still infertility prevails, IUI cannot improve the situation. On the other hand, when IUI was performed in cases with unsatisfactory IUA finding the success rate was found 46.66%. The baseline seminal parameters have also been considered while analyzing the results. It has also been found that whatever be the baseline seminal parameters the ultimate decisive factor is the motile sperm concentration in utero. Even in poor semen in motility is good and sperm entry into uterine cavity is satisfactory; the possibility of normal pregnancy remains high. In this connection it may be recalled that in fertile population also certain pregnancy of male partners have poor or subfertile semen parameters\(^6\) as per WHO standard\(^2\). During classification of IUA into different groups according to the availability of number of motile spermatozoa (as in cased of PCT) it has been observed that presence of less number spermatozoa in the aspirate might results from either less entry of the cell in to the cavity or more escape towards the fallopian tube following entry in to the cavity in good number. This group is referred to as poor IUA group. Interpretation of poor IUA should be considered from different angles. When poor IUA is associated whit either good of fair PCT, the whole results is satisfactory and such cases results in more spontaneous pregnancies (63.63% and 17.64% PR respectively) than in the other groups. On the other hand, in the poor IUA-fair group if diminution in the number of sperm cells (compared to the good PCT subclass of this group) is due to oligoasthenozoospermia which does not respond to medical management IUI might be an alternative and if due to cervical hostility IUI should be the only sensible way out. When poor IUA is associated with
poor PCT, interpretation becomes difficult. In this group one thing is to be kept in mind, that, in some cases the highly motile sperm which entered cervical mucus might have quickly moved to the uterine cavity, then into the fallopian tubes giving rise to poor IUA and poor PCT.

These cases ended up in spontaneous pregnancies. This interpretation is justified by the results of 17.64% spontaneous pregnancy rate achieved in this group. For remaining cases it is assumed that a poor number of spermatozoa enter the Cm and thereby the uterine cavity. Hence the tubal spermatozoal concentration also remains poor and unable to results in pregnancy. This group is considered unsatisfactory so far natural conception is concerned. For this group IUI is advocated satisfactorily\(^3\) which is revealed from a 46.66% pregnancy rate from IUI of patients belongs to poor IUA – poor PCT group. Hence the Couple in this group were subjects to IUI only if infertility continues even after allowing cycles of TI\(^3\).

The two possibilities that may lead to good IUA results are either the sperm cell not leave the uterine cavity and go to the tubes due to tubal block or the concentration of the sperm is so high that even after many cells have gone into the tubes the remaining number is still high. In cases when good IUA is associated with fair to poor PCT we came across results with no pregnancy. Laparoscopy later on proved all of them to have tubal lock, which confirmed our observation. The reason behind getting very few cases in this group may be that most of the patients under study, had their tubal problems already sorted out. It is evident from the results also that number of patients available under the good IUA class was significantly small compared to that under the poor IUA group. On the other hand, if the sperm concentration is very high in CM, which means excellent PCT, good IUA may indicate the second possibility. In this group 20% pregnancies occurred have been spontaneous. From this angle this test can be used for indirect or rough assessment of patency of fallopian tubes as well. It is thus evident that though motile sperm concentration in this group is considered good it is low scoring compared to the poor IUA group as far as spontaneous PR is concerned.

In many patients where poor IUA with good/fair PCT was found and still infertility continued even after performing IUI, laparoscopy was undertaken which detected other factors of infertility like endometriosis and/or minor tubal defects. This observation clearly indicates that IUI has no role play in changing the scenario of infertility when spontaneous sperm entry into the uterine cavity is satisfactory. In support of this finding it is important to mention that in the period January, 1999 to June, 2000 we performed 300 IUI cases for patients whose selection were out according to the available standard criteria\(^7,8\) and the success rate was 14.32% only, whereas after introduction of IUA screening the IUI success rate of the clinic has reached as high as 46.66% in selected cases.

From the above study it is therefore evident that though PCT is a poor predictor of pregnancy success, the combined PCT IUA-CM test can serve as an excellent guideline to predict normal pregnancy in ovulatory (spontaneous of induced) women as well as select the cases that would benefit from UIU. This very simple procedure of purely non-invasive nature can also provide of COX -2 was postulated to afford similar to NSAIDs but with better GI tolerability.
Selective COX-2 inhibitors like ETC could have therapeutic advantage over NSAIDs because COX-2 is the predominant-COX at sites of inflammation, whereas COX-1 is the major source of cytoprotective prostaglandins in the GI tract. The matter is not settled, but the anti-inflammatory actions of the coxibs were associated with improved GI safety compared with there non-selective counterparts in at least one trial of clinical outcome\textsuperscript{13}. DFC IS approved in the until states for long-term symptomatic treatment of rheumatoid arthritis, OA, and ankylosing spondylitis. It is the most commonly used NSAID in europe\textsuperscript{14}.

ETC is approved in the UK as a once-daily medicine for symptomatic relief in the treatment of OA, rheumatoid arthritis, and acute gouty arthritis, as well as for short-term treatment of musculoskeletal pain, postoperative pain, and primary dysmenorrhoea\textsuperscript{15}. It exhibits a reduce risk of GI toxicity compared with non-selective NSAIDs\textsuperscript{16}. Its clinically important anti inflammatory and efficacy in the treatment of acute and chronic pain its favourable safety and tolerability profile as once-daily dosing regimen have been shown in numerous diseases and treatment setting and have been reviewed elsewhere\textsuperscript{17}.

The present study also corroborated with the impression that ETC produced less GI adverse events, but in equal effective dose, produced more improvement of the clinical condition OA study population.

REFERENCES


Some indirect but useful information regarding tubal patency.

REFERENCE