

AUDIT OF INTRA-UTERINE INSEMINATION WITH PARTNER'S SPERM

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INTRODUCTION

Intra-uterine insemination (IUI) refers to the direct transfer of sperm to the intra-uterine cavity. It has been used for a variety of indications for greatly varying pregnancy rates, including infertility due to male factor, cervical hostility or antisperm antibodies and idiopathic infertility.

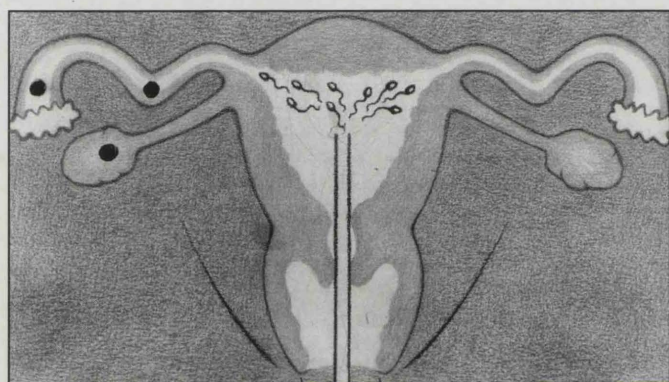


Figure 1 Direct transfer of sperm to the uterine cavity

The most frequently reported indication for treatment with IUI is infertility due to male factor including low sperm counts and poor sperm motility. Most authors note a poor success rate with male factor infertility; this is not however included in the selection criteria in our unit. Patients treated with IUI for infertility associated with cervical factor achieved a higher pregnancy rate, as did patients with unexplained infertility. Empirical treatment of unexplained infertility with superovulation combined with IUI was proposed by Sher *et al* in 1984.⁽¹⁾

Underlying unexplained infertility, including mild endometriosis and abnormalities associated with ovulation, may be subtle causes of subfertility, hence the rationale for using controlled ovarian hyperstimulation with IUI. This is achieved with gonadotrophin injections without prior pituitary desensitisation. Treatment usually starts on day 2 of the cycle and USS monitoring commences on day 9. Ovarian stimulation is continued until there are two to three follicles of 16mm or more. This should boost the fertility.

Sperm can be prepared in a number of ways. It can be achieved by albumin column technique, or a discontinuous percoll gradient, or a swim-up technique. In this unit we use the swim-up technique. Sperm washing is achieved by diluting a sample of liquefied sperm in culture medium followed by centrifugation and resuspension in the medium, thereby removing seminal plasma but leaving bacteria and motile spermatozoa in the preparation. The sample is enhanced further if the wash is repeated and the sperm then left to swim up to the surface for thirty to sixty minutes.

IUI is performed thirty to forty hours after β hCG injection. 0.1 to 1 ml of prepared sperm is placed in the uterine cavity using a fine cannula.

All patients are fully investigated and those who fulfil the criteria are enrolled for controlled ovarian hyperstimulation and IUI with partner's sperm. Each couple is offered three treatment cycles.

AIM OF THE AUDIT

The aim was to determine the effectiveness of IUI treatment with controlled ovarian hyperstimulation (COH) in a district general hospital.

STANDARDS

Couples who meet the following criteria are eligible for recruitment to the IUI programme at Furness General Hospital:-

- Unexplained infertility
 - cervical factor
 - minimal endometriosis
 - anovulatory – where simple ovulation induction failed
- age of female ≤ 40 years
- number of follicles 2-3
- number of cycles 3 maximum
- sperm quality 1×10^6
 - $\geq 80\%$ motile } in practice sperm preparation

METHODOLOGY

The infertility clinic diaries were used as the data source to identify patients who underwent infertility treatment in the form of IUI during a two-year period (January 1996 to December 1997). Patients who were still receiving treatment were excluded from the population sample. The medical casenotes incorporating the gynaecological notes and relevant maternity notes were extracted. A proforma was designed for retrospective data collection.

RESULTS

Forty couples met the criteria for selection during the two-year audit period. The majority of females (33) were in the 30-39 age group (median age 33 years). 78% had primary infertility (median duration five years). The sperm count was normal in 78% of males (31) and subnormal in 15% (6). No information was recorded for three males (7%). There was an

overlap in the indications for referral. Unexplained infertility accounted for 47.5% (Table 1).

Indication	Number	Overlap %
Unexplained infertility	19	47.5
Cervical factor	8	20.0
Minimal endometriosis	7	17.5
Anovulation	8	20.0
Other: Male factor = 6	8	20.0
Partial tubal blockage = 2		

Table 1 Overlap of indications for referral. n=40

Seven couples (17.5%) withdrew from the programme prior to treatment, mainly because of personal problems or the programme was too stressful. A request for donor insemination was made by one couple.

Of the 33 couples who continued on the programme, 25 (76%) met the criteria for selection. A subnormal sperm count was recorded for six males (18%). Two females (6%) had a partial tubal blockage. One abandoned the programme after receiving two cycles of treatment and the other became pregnant by natural conception one month after the first cycle. The duration of infertility for the 33 couples ranged from 1-13 years (median four years). All patients received COH. Overall there was a total of 64 treatment cycles (Table 2).

Number of cycles	Number of patients	Percentage
1	14	42.5%
2	7	21.0%
3	12	36.5%

Table 2 Treatment cycles per patient. n=33

Thirty-five treatment cycles (55%) failed to produce the required number of eggs. Three patients produced more than three follicles. Two women continued on the programme and later produced two follicles at the next treatment cycle and both later referred for IVF. Both patients failed to conceive at the third treatment cycle and were later referred for IVF. One patient who produced six follicles after the first treatment cycle also had Raynaud's and scleroderma. It was thought that a pregnancy might aggravate her pre-existing medical condition. She was withdrawn from the programme and not referred for IVF.

Female age	Duration of infertility	Indication for referral	Conception cycle	Number of follicles	Treatment to conception	Sperm Count
31	1 year	unexplained infertility	first	2	1 year	normal
32	1 year	unexplained infertility	third	1	1 year	normal
33	3 years	anovulation	second	3	1 year	normal
34	6 years	unexplained infertility	second	2	1.5 years	normal
35	8 years	minimal endometriosis	first	2	1 year	normal

Table 3 Characterisation of patients who conceived. n=5

There were six patients who conceived following treatment. One patient had a natural conception one month after her first treatment cycle. Thus the pregnancy rate following COH was 8% per cycle. It was noted that the five couples had all met the programme recruitment criteria. Overall they received a total of nine treatment cycles before conception (Table 3).

A fullterm pregnancy was achieved by four patients (Table 4). The fifth pregnancy was an ectopic gestation which proceeded to a linear salpingostomy.

pregnancy rate per cycle	5/64	8%
overall pregnancy rate	5/33	15%
live birth rate	4/33	12%

Table 4 Pregnancy rate. n=33

Twenty-seven patients (82%) failed to conceive following treatment (Table 5).

Outcome	Number of patients
referred for IVF	18
referred for donor insemination	1
referred to urologist	1
abandoned treatment	7

Table 5 Outcome of patient who failed to conceive. n=27

No further contact was made by two of the seven patients who abandoned treatment. Two patients were withdrawn from the programme because of ovarian hyperstimulation. Another was withdrawn because of a poor response and was advised to lose weight. One patient abandoned the programme because of a mental breakdown. The seventh patient had three treatment cycles but failed to conceive. There was no documentation as to whether this patient was referred for IVF.

ADHERENCE TO STANDARDS

- Standard 1
- 25 of the 33 patients met the criteria for selection = 76%
- Standard 2
- 33 females were within the age group ≤40 years = 100%
- Standard 3
- 29 of the 64 treatment cycles produced 2-3 follicles = 45%
- Standard 4
- 33 patients were offered a maximum of three treatment cycles = 100%
- Standard 5
- 27 males had a normal sperm count = 82%

CONCLUSION

The audit revealed an overall pregnancy rate of 15% and live birth rate of 12%, which compares favourably with published research findings. Three of the five standards, however, were not achieved. The five couples who became pregnant all met the criteria for selection and produced two to three follicles per treatment cycle. Whilst it appears from the data that the number of follicles per treatment cycle is important, all five standards appear to be equally important in order to achieve a successful outcome. Strict adherence to the criteria for selection will improve the success rate.

The six males with a subnormal sperm count were recruited to the programme prior to 1996 when this factor was included in the selection criteria. Subsequently five of the six couples were referred for IVF and the sixth was referred for donor insemination. Similarly, tubal blockage is not an indication for IUI and two females with partial tubal blockage were recruited for treatment. If these eight patients had not been recruited to the programme the pregnancy rate would have been 20%. This highlights the importance of the selection criteria.

RECOMMENDATIONS

- Strict adherence to the eligibility criteria will further improve the success rate
- treatment cycles which produce fewer than two follicles should be abandoned
- treatment protocols for COH should be revised
- reducing the female age limit to 36 years would lead to earlier IVF referral and thereby increase the chance of success in that treatment
- consideration should be given to pre-treatment of sperm and transuterine intra-tubal insemination

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