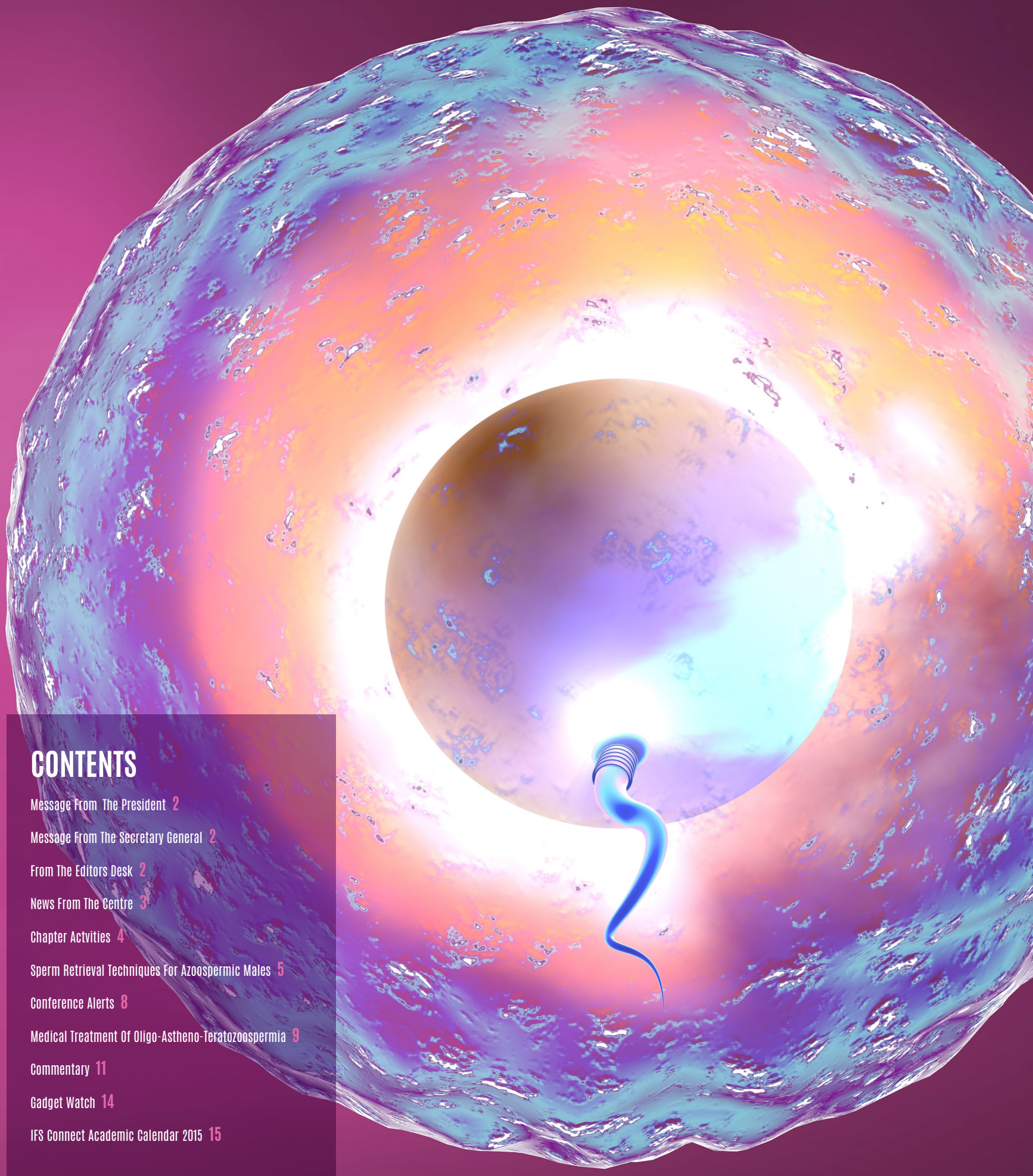
Vol 2 Dec. 2014

IFS CONVERSATIONS



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MESSAGE FROM
THE PRESIDENT

Dear Friends,

The second newsletter of the year brings you the highlights of the IFS activities. A lot has happened as you can see. The society that was taking small but sure steps all these years is now ready for a great leap!

We are proud to announce our clinical fellowship program and our embryology course in collaboration with ESHRE. Our teaching modules in the form of IUI Workshops have been widely conducted across cities in India. Our IVF master classes called IVF – CONNECT have given a platform to our juniors to present their work.

Our journal is now a reality. The editorial team has brilliantly put the first issue together. A feather in our cap is the first Indian multi specialty clinical practice guideline on PCOS which you will find in the journal. I am sure you will find it useful.

The society understands the difficulty of its members in getting access to conferences and meetings. As a pilot initiative, we have started web based CME'S or webinars for our members. These will be telecast from 6 different stations. Please take a look at the schedule in this Conversations and join in.

As a small initiative to encourage data entry and research amongst members, the society has started a small survey on the use of clomiphene amongst doctors. You would have received the form or will shortly receive it. Do fill it up and take part in this activity.

The website will soon have a new look with lots of interactive material in the members log in area. Please watch out for the same and become a member if you are not.

The editorial team of our newsletter Conversations has not only passed on this information to you but has collected very useful articles/papers on male infertility. I congratulate them for putting together such an excellent newsletter for all of us.
My request to all you members is to stay connected and involve your selves in some activity of the society.

Wishing you and your families a very happy new year!

With best wishes
Sonia Malik, *President IFS*

MESSAGE FROM
THE SECRETARY GENERAL

Dear Friends and Colleagues,

In recent years there is a decline trend of fertility all over the globe. Incidence of male infertility is at rise and is distressing in which reproductive abnormalities frequently play an important role. Assessment requires an understanding of the control of spermatogenesis and factors responsible for normal sperm function. Male evaluation is to identify these conditions when present. Identification and treatment of reversible conditions may improve the male's fertility and allow for conception by natural way. Standard tests for assessment of semen quality frequently fail to detect impaired function, but newer tests are now available to measure sperm movement and their ability to penetrate the ovum. Algorithmic- approaches based on laboratory data can be used to characterize subgroups of infertile men, but many patients have subtle abnormalities. Detection of certain genetic causes of male infertility allows couples to be informed about the potential to transmit genetic abnormalities that may affect the health of offspring. Thus, an appropriate male evaluation may allow the couple to better understand the basis of their infertility and to obtain genetic counseling when appropriate.

This issue of bulletin is specially designed on the problems of male infertility will be helpful to readers to identify the various aspects etiological factors and management to achieve the successful conception.

Each year the society brings distinguished faculty from all over the world at the annual conference of Fertivision, and keeping with the fervour we have an exciting congress at Pune in December. So friends cash on this academic feast and join to meet, learn and network with like minded clinicians and researchers from overseas and India. Reserve your place right away for our annual Fertivision 2014.

With all best wishes!
Prof. Sudha Prasad, *Secretary General*

FROM THE
EDITORS DESK

Welcome back to yet another quarterly of the IFS conversation- the winter issue of the newsletter. This time we come after a festive season of October and move to ending the year with the count down on Christmas and New Year. The IFS conversation coincides not only with the Annual conference, Fertivision-2014, at Pune but also with the first issue of our journal "Fertility Science and Research". So it is academics for our members and readers all the way!

The aim of this newsletter is to provide comprehensive update on select topics in Reproductive Medicine, and in keeping with our promise this issue covers Male Infertility. The relevance of the subject of male infertility in the present day may still befitting a space in the IFS conversation despite the advent of intra-cytoplasmic sperm injection (ICSI) or more so intra-cytoplasmic morphologically selected sperm injection (IMSI). The topic on evaluation of the male partner has been covered by Dr. Gopinath in a lucid manner. The article thoughtfully written with Indian audience in mind, draws light on the current practice in approach to infertile men. The surgical techniques of sperm retrieval have been elaborated by Dr. Sandro Esteves, our international faculty for this issue. An expert in andrology he has skillfully described the basics and technicalities of available surgical procedures.

At the editorial board at the very start we felt the need to update our reader's clinicians and embryologist alike on the newer advances from the world of gizmos. Keeping with these sentiments we bring forth a thorough update on bench-top incubators. We hope you all enjoy this section with tips on bench-tops that have been put together by Dr. Pankaj Talwar. Not only have you an insight into the technical specifications but the Indian distributors which should be handy for all who feel the need to upgrade their laboratories.

As our society grows over days and months we update you with activities from our chapters and it is impressive to see this young society grow with brilliance and efforts from colleagues as you go through the newsletter with snapshots from Punjab, Maharashtra, Madhya Pradesh and Uttar Pradesh chapters.

So as you read through the newsletter and enjoy the academic carnival at Fertivision-2014, we at the editorial board wish you a very prosperous New Year ahead. May this year usher us into academic excellence so that we keep meeting your expectations with yet another quarterly of IFS conversation.

Happy Reading!

Dr. Neena Malhotra
Editor IFS

Prof. (Dr.) Pankaj Talwar
Joint Editor IFS

THE COMMITTEE
MEMBERS

NEWS FROM
THE CENTRE

IUI WORKSHOPS

IFS has formulated a problem-oriented module for the IUI Workshop, consisting of a series of inter-related lectures and flow-charts which are visually appealing and simple to comprehend. Many delegates gave rave reviews about a highly interactive and engrossing scientific dialogue. Literature was provided to the delegates as printed modules and the session ended with live hands-on demonstration of various semen preparation techniques at these workshops. IUI workshops were successfully held at Bareilly, Varanasi, Dehradun, Gwaliar.

IFS CONNECT

The programme has been designed for the practicing ART clinicians and embryologist. The CME's is designed as knowledge sharing plateform for the enthusiastic young clinicians where they can present their work and interact with more experienced colleagues and develop guide lines. Such courses bridge the gap between the practicing clinicians and academicians. IFS connect as name implies is the only formal teaching programme in country which encourages presentation of personal data by the young generation and they are trained by the senior clinicians to take on the international stage in coming years. MP and Haryana chapter conducted this in the last quarter.

CME on "endometriosis - current concepts and management" in hotel City Park organized by Origyn Fertility and IVF, Max Hospital, Pitampura under the aegis of IFS on 13.9.14 .The CME had more than 100 delegates and all aspects of endometriosis were introspected by the experts in this field.

Two Hands on Live Workshops on vitrification and Quality control /assurance were organized by the Dept of obstetrics and Gynaecology,Army Hospital (Research and Referral), New Delhi in last quarter. Expert in the fields deliberated on various essential topics pertaining to lab management advances in cryobiology and time lapse technology. Hands on live workshop followed the didactic lectures. For the first time all equipment required for quality control of the laboratory were demonstrated under one roof. The event was well attended by the young embryologist and clinicians across north India.

CLOMIPHENE SURVEY

Clomiphene Citrate is approved for induction of ovulation in patients with persistent ovulatory dysfunction. This drug is available in India since 1974. This drug has unique place in therapy and used (and misused) extensively in routine clinical practice. Even a resistance to Clomiphene is been reported. There is paucity of clinical data related to safety, efficacy and resistance pattern of Clomiphene in routine clinical practice. In this situation, Indian Fertility Society (IFS) would like to generate the data related to Clomiphene quickly.

This survey was initiated in Nov 2014 and presently ongoing. Unichem Laboratories Ltd is taking care of operational part of this survey. During this survey, we are planning to contact approximate 3000 practising gynecologists across the contry with specially designed folders which contains invitation letter from IFS for participation, undertaking form for participation and one page specially designed survey questionnaire.

With successful initiation and positive response of this survey, IFS is planning to initiate two more surveys on endometriosis and recurrent abortion. The objective of these surveys would be to understand current knowledge, attitude and practices related to these commonly noted clinical conditions in routine clinical practice. We hope these initiative will help us to generate the Indian data quickly and will help us to understand current situations of these conditions at real life scenario.

WEBINAR PROGRAMME

HOPE: Webcast Based Training Course in Infertility Management

Infertility is an important public health concern and commonly encountered in day-to-day practice and needs to be addressed scientifically. Considering the burden of infertility across the country there is a need of many infertility experts to address infertility and other associated socioeconomic issues. Training courses for infertility management are not easily available and accessible at primary care level. Even many practicing infertility experts find it difficult to cope up with extensive developments in this field.

IFS intends to introduce a web based training program called "HOPE" for management of infertility aiming to lay a new blueprint for infertility management. This course will encompass all essential aspects of infertility management using an interactive platform. This would be a webcast-based course telecasted live across 30 major locations in India. The live webcast will have two to four lectures, with total duration of 2.5 hrs. There will be 06 webcasts in total assembling a gamut of over 1500 doctors across the country. It will be supported by an unrestricted educational grant from Unichem Laboratories Ltd. These webcasts will be segregated into 2 different sets of 15 locations each and will be telecasted on scheduled dates. First webcast at 15 locations is scheduled on 10th Jan 2015. All participating doctors will be certified by IFS.

This program will be organized in following locations: Amritsar, Aurangabad, Bangalore, Bhopal, Burdwan, Chandigarh, Chennai, Coimbatore, Delhi and Gurgaon, Hubli, Hyderabad, Indore, Jaipur, Jodhpur, Kanpur, Kolkata, Lucknow, Meerut, Mumbai (C), Mumbai (W), Nagpur, Patna, Pune, Raipur, Ranchi, Rohtak, Secunderabad, Surat and Vijaywada.

IFS JOURNAL

With the Inaugural issue of "Fertility Science and Research" an official journal of Indian Fertility Society, we initiate a conceptual framework for thinking and writing about research, in different areas of infertility and Assisted Reproduction. The framework takes the form at three levels: (1) Focus areas of the research practices through which the journal aims to achieve excellence and strengthen its profile and visibility (2) Strong base of the editorial Team, a mix of highly acclaimed academicians professors and dedicated experienced reviewers(3) Active readers will able to be useful for the clinician, researchers, embryologist and reproductive Biologist with Gynecologist.

The publication is a peer-reviewed online journal with semiannual print circulation. The journal's full text is available online at http:www.fertilitysciencesresearch.org, allows free access to its contents and permits authors to self-archive final accepted version of the articles on any OAI-compliant institutional/subject-based repository, with facilities like Time bound-peer review system, Triple Blind Peer reviewed method.

This journal will have Editorial, Review articles, original articles from clinical, embryology and newer technology areas, Case reports and Book reviews, with aim to publish original articles, critical review of Published articles in Indian perspective, to promote debate & consensus in controversial field and make a stand in the world academics and make FSR journal in the Index Category with High Impact factor.

This issue includes interesting editorial on reducing dropout rate in ART practices, thought provoking commentary, IVF for all or few? review articles on In Vitro Maturation, Fertility Preservation & Oxiditative stress and Endometriosis with two original articles and case reports. And evidence based well-drafted PCOS guidelines.

On the behalf of entire team we would like to extend our heartfelt thanks to all who have helped us throughout making of this journal specially our contributors of this inaugural issue.

IFS FELLOW SHIP PROGRAMME

Almost 10% of all couples desirous of pregnancy have difficulty in conceiving. With the advent of Assisted Reproductive Techniques (ART), infertility has become a treatable medical condition. Approximately 10% of infertile couples will require advanced ART techniques to overcome infertility. New IVF centers are opening up at a very fast pace. Increasing number of Obstetrics and Gynaecology postgraduates are interested in providing ART services. However, there are very few post-doctoral structured training program in ART in India. Fellowship of the National Board and Rajiv Gandhi University In Bangalore are few examples. There is a huge unmet need for such courses. One of the main objectives of the society is to promote education in the field of ART. One year Fellowship program in ART (clinical) has been initiated this year under the aegis of IFS.By the time you read this news letter 18 candidates would have appeared for the written exam and viva competing for 12 seats. The response to the fellowship has been enormous and we plan to increase the number of seats to 20 next year.

PCOS CONSENSUS MEETINGS

PCOS is an important emergent public health problem in India that represents a unique trans-generational risk of transmission of a variety of systemic chronic diseases. It has not been possible in contemporary Indian clinical practice to formulate a comprehensive response, which is commensurate with the scale of problem that PCOS poses. This has been mainly due to a lack of strong public and academic discourse centered on the proper management of this gargantuan, yet ill-recognized problem. A strong evidentiary foundation is the cornerstone on which the academic discourse on PCOS must be based. In addressing a key driver that feeds the inertia surrounding PCOS, the current GCPR seek to fundamentally redefine the paradigms of PCOS care in India. The approach of current recommendations is to provide a strong rationale for harnessing the mutual synergies in a modern multidisciplinary clinical setting to deliver quality PCOS care while providing an evidence-based structure to standardize the approach to PCOS management across treatment settings.. The committee has 76 members, and Multispeciality Meeting was held in North East (New Delhi); South West (Mumbai) in April and June 2014. The programme is supported by Bayer Zydus and was initiated in April 2014. The guidelines are being presently published in the inaugural journal of IFS.

OUR CHAPTERS

UTTARAKHAND

IUI workshop at Dehradun organised on 12 Oct 2014 at MJ Residency Hotel. It was locally organized by Dr Sumita Prabhakar

MADHYA PRADESH

Hands on IUI Worksop was held in Gwaliar at Dr.Verma Fertility Centre on 23/11/2014.
All IVF experts from MP & Chatisgarh, participated in one day Conf. on 12 Oct. at Raipur, (IVF-Connect). National Exec Members- Dr S Prasad & Dr Gouri Devi inaurated the conf. was attended by 60 delegates.

MAHARASTRA

Advanced Semenology workshop was held on 14 Sept 2014 in Pune at Hotel Pride.

Delegates : 130

This was a unique one of its kind of a workshop for the first time conducted in India on advanced Semenology.

The delegates were a mixed group from various fields, Embryologist, Pathologist, clinicians, Gynaecologist, Microbiologist, Cryobiologist and researchers from all over India. Who were very appreciative of this workshop. Many could not attend due to simultaneous other conferences on infertitiy on the same day and have expreseed their regret Got very good feedback both during the discussion and after the conference for the format, the lectures the content and the speakers. All got excellent rating. Got calls asking when we having next such type of conference, looking forward to participating then. Enquires and discussed with them regards us conducting similar workshop in near future.

It was attended by delegates from Talegaon, Aurangabad, Nashik, Baramati, Ahmednagar, Thane, Mumbai – Andheri, Gujrat-Surat & Baroda, Daund, Hyderabad, Bangalore, Gwalior, New Delhi, Haryana – Karnal.

UTTAR PRADESH

The following are the activities undertaken from October 2012 to October 2014:
National CME on 'Infertility Update' organised by SRMS IMS Bareilly in July 2014.
IFS IUI workshop at Bareilly by Dr. Latika Agarwal on 31st august 2014 attended by around 70 delegates.

PUNJAB

IUI workshop held in the month of October. Nearly 35 delegates from different parts of Punjab. They were given hands on training by the embryologist.

HARYANA

Conducted IFS connect programme on 16 Nov 2014. More than 90 delegates attended the clinical meet. It was organised by Dr Ritu Jain from gurgoan.

SPERM RETRIEVAL TECHNIQUES FOR AZOOSPERMIC MALES

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Sperm retrieval techniques (SRTs) are surgical methods that have been developed to obtain spermatozoa from the epididymis and testicles of azoospermic men seeking fertility treatment. After sperm acquisition, intracytoplasmic sperm injection (ICSI) is used instead of standard in vitro fertilization (IVF) because ICSI has been shown to result in a significantly higher fertilization rate. Alternatively the retrieved sperm can be cryopreserved for use in future sperm injection attempts. The use of non-ejaculated sperm and ICSI has become an established procedure for couples whose male partner has azoospermia to obtain biological offspring.

The method of choice for sperm retrieval (SR) is based on the type of azoospermia, which can be obstructive or nonobstructive and the attending surgeon's preferences and experience. Microsurgical ductal reconstruction is generally considered to be a cost-effective treatment that allows for natural conception in selected cases of OA, such as post-vasectomy. Despite being highly successful, ductal recanalization may not be an option for some infertile couple or may be impossible in certain cases of congenital obstructions and post-infectious obstruction or failed vasectomy reversals. Spermatozoa can be retrieved from the epididymis or testicles in almost all cases of OA, irrespective of the technique used for sperm collection and the cause of obstruction. Nonobstructive azoospermia (NOA) on the other hand is a consequence of spermatogenic failure and is the cause of most cases of azoospermia. NOA has congenital and acquired etiologies other than hypothalamic-pituitary disease and obstruction of the male genital tract. In such cases spermatogenesis may be focal which means that spermatozoa can be found and used for ICSI in approximately 30-60% of men with NOA. Testicular sperm extraction (TESE) is the technique of choice for NOA and the use of microsurgery for TESE seems to increase retrieval rates.

Three main goals should be accomplished during sperm retrieval:

(i) Acquisition of an adequate number of sperm for both immediate use and cryopreservation

(ii) Retrieval of the highest quality of sperm

(iii) Minimizing the damage to the reproductive tract

A list of the candidates eligible for sperm retrieval is provided in Table 1.

SPERM RETRIEVAL: AVAILABLE METHODS AND TECHNICAL ASPECTS

The two general SR methods are open surgery and percutaneous acquisition. Open surgery can be performed to retrieve spermatozoa from the epididymis or the testicle with or without microsurgery. Percutaneous retrievals, on the other hand, require a needle to be percutaneously inserted into the sperm source, i.e., the epididymis or the testicle. Irrespective of the method used the goal of SR is to obtain the epididymal fluid or the seminiferous tubules and their contents.

Table 2 lists the SR options available and their indications.

Table 3 compares the advantages and disadvantages of the different SR methods.

Preoperative Considerations

The procedure, results, and potential complications should be reviewed and discussed with the patient and his spouse by experienced staff. The patient should sign an informed consent form prior to surgery. In addition aspirin and/or nonsteroidal anti-inflammatory drugs should be avoided for one week before surgery. Those patients taking anti-coagulating agents should discontinue the medication during the preoperative period. Scrotal hair shaving is required for open retrievals and patients should be instructed to void the bladder prior to admission to the operating room.

Operating Room and Patient Preparation

All the instruments and materials used during the sperm retrieval procedure should be assessed for availability and/ or operational conditions. The patient should be positioned on the operating table

Table 1: Candidates for sperm retrieval, grouped according to the type and etiology of azoospermia.

Obstructive Azoospermia	Non-obstructive Azoospermia (Testicular Failure)
Congenital Ductal Obstructions: • **Congenital bilateral absence of the vas deferens** • **Young's syndrome (clinical triad of chronic sinusitis, bronchiectasis, and obstructive azoospermia)** • **Stenosis or atresia of the ejaculatory ducts** • **Midline prostatic cysts (utricular and Müllerian cysts)** • **Ejaculatory duct cysts** • **Seminal vesicle cysts**	Congenital Testicular Failure: • Testicular dysgenesis/cryptorchidism • Genetic abnormalities (Klinefelter syndrome, Y chromosome microdeletions*) • Germ cell aplasia (Sertoli cell-only syndrome) • Spermatogenic (maturation) arrest
Acquired Ductal Obstructions: • **Post-infection (epididymits, prostatitis, seminal vesiculitis)** • **Post-vasectomy** • **Post-surgical (epididymal cysts, hernia repair, scrotal surgery, bladder neck surgery, prostatectomy)** • **Iatrogenic (urologic endoscopic instrumentation)**	Acquired Testicular Failure: • Testicular trauma • Testicular torsion • Post-inflammatory (e.g., mumps orchitis) • Exogenous factors (steroid medications, cytotoxic drugs, irradiation, heat) • Systemic diseases (liver cirrhosis, renal failure) • Testicular tumor • Varicocele • Post-surgical (surgeries that may compromise testicular vascularization, resulting in testicular atrophy
Idiopathic • **Idiopathic epididymal obstruction**	Idiopathic (unknown etiology)

* The likelihood of obtaining sperm at sperm retrieval is virtually zero when complete AZFa and/or AZFb Yq microdeletions are found.

Table 2: Sperm retrieval techniques, acronyms and indications.

Technique	Acronym	Indications
Percutaneous epididymal sperm aspiration	PESA	Obstructive azoospermia
Microsurgical epididymal sperm aspiration	MESA	Obstructive azoospermia
Open epididymal fine-needle aspiration	ND	Obstructive azoospermia
Percutaneous testicular sperm aspiration; percutaneous testicular fine-needle aspiration	TESA; TEFNA	• Obstructive azoospermia; • Failed epididymal retrieval in OA cases; • Epididymal agenesis in CAVD cases; • Favorable testicular histopathology[1] inNDA cases; • Previous successful TESA/TEFNA attempt in NOA cases
Testicular sperm extraction (single or multiple biopsies)	TESE	• Obstructive azoospermia; • Failed epididymal retrieval in OA cases; • Failed TESA/TEFNA in OA cases; • Non-obstructive azoospermia
Single seminiferous tubulesbiopsy	ND	• Obstructive azoospermia; • Failed epididymal retrieval in OA cases; • Failed TESA/TEFNA in OA cases; • Non-obstructive azoospermia
Microsurgical testicular sperm extraction	Micro-TESE	Non-obstructive azoospermia

OA: obstructive azoospermia; NOA: non-obstructive azoospermia. CAVD: congenital absence of the vas deferens. ND: not defined.
[1] Hypospermatogenesis.

Table 3: Advantages and disadvantages of sperm retrieval techniques.

	Advantages	Disadvantages
PESA	• Fast and low cost; • Minimal morbidity, repeatable; • No microsurgical expertise required; • Few instruments and materials; • No open surgical exploration	• Few sperm retrieved; • Limited number of sperm for cryopreservation • Fibrosis and obstruction at the aspiration site • Risk of hematoma/spermatocele
Open epididymal fine-needle aspiration	• Repeatable; • No microsurgical expertise required; • Relatively large number of sperm for cryopreservation; • Few instruments and materials	• Open surgical exploration required; • Increased cost and time-demanding; • Fibrosis and obstruction at the aspiration site • Postoperative discomfort; • Not validated in a large series of patients
MESA	• Large number of sperm retrieved; • High number of sperm for cryopreservation; • Reduced risk of hematoma; • Reconstruction possible1	• Open surgical exploration required; • Increased cost and time-demanding; • Operating microscope required; • Microsurgical instruments and expertise required • Postoperative discomfort
TESA	• Fast and low cost; • Repeatable; • No open surgical exploration; • No microsurgical expertise required; • Few instruments and materials; • Minimal/mild postoperative discomford	• Relatively low success rate in NOA cases; • Few sperm retrieved in NOA cases; • Limited number of sperm for cryopreservation • Risk of hematoma/testicular atrophy
TEFNA	• Fast and low cost; • Repeatable; • No open surgical exploration; • No microsurgical expertise required; • Few instruments and materials required; • Minimal/mild postoperative discomfort	• Few sperm retrieved in NOA cases; • Limited number of sperm for cryopreservation; • Risk of hematoma/testicular atrophy; • Not validated in a large series of patients
TESE	• No microsurgical expertise required; Repeatable	• Increased cost and time-demanding; • Open surgical exploration required; • Relatively few sperm retrieved in NOA cases; • Risk of testicular atrophy3; • Risk of testicular androgen production impairment; • Postoperative discomfort
Single seminiferous tubule biopsy	• No microsurgical expertise required; • Repeatable	• Increased cost and time-demanding; • Open surgical exploration required; • Relatively few sperm retrieved in NOA; • Postoperative discomfort; • Not validated in a large series of patients
Micro-TESE	• Higher success rates in NOA cases2; • Larger number of sperm retrieved2; • Relatively higher chance of sperm cryopreservation2; • Low risk of complications	• Surgical exploration required; • Increased cost and time-demanding; • Operating microscope required; • Microsurgical instruments and expertise required • Postoperative discomfort

PESA: percutaneous epididymal sperm aspiration; MESA: microsurgical epididymal sperm. aspiration; TESA: percutaneous testicular sperm aspiration; TESE: conventional testicular sperm extraction; micro-TESE: microsurgical testicular sperm extraction; [1]in cases of post-vasectomy obstructions. [2]compare with TESA and TESE in NOA cases. [3]multiple biopsy-TESE.

in a supine position. For microsurgical techniques the operating microscope should be positioned and adjusted. The skin should be cleansed from mid-abdomen to mid-thigh using a povidone-iodine or similar solution. Sterile drapes should be positioned in a manner such that only the scrotum is exposed. A list of instruments and materials that are commonly used in sperm retrievals is provided in Table 4.

Anesthesia

Sperm retrievals are relatively simple surgeries that can be safely performed with general anesthesia or spinal blocks. However because sperm retrievals are typically outpatient procedures the latest trend is to employ local or locoregional anesthesia with or without intravenous sedation.

Conventional Open Sperm Retrieval Methods

Open surgical SR can be used for both epididymal and testicular sperm collection. In both cases a scrotal incision is made to approach the epididymis or the testis. Testicular delivery to facilitate the exposure of the epididymis or testis is optional as the procedures can be carried out without testis delivery using the "window" technique. In the open epididymal sperm aspiration the goal is to puncture an epididymal tubule and aspirate the epididymal fluid using a needle. In the open testicular sperm extraction (TESE) procedure either a large single biopsy or multiple biopsies are performed to obtain seminiferous tubules and their contents. In both cases the retrieved spermatozoa can be used for fresh sperm injection or cryopreserved for a single or multiple subsequent ICSI attempts. Open epididymal sperm aspirations are only indicated in OA cases, whereas open testicular extractions can be used in both OA and selected NOA cases.

Open Epididymal Fine-Needle Aspiration:

The epididymis is exposed and a tubule is directly punctured through the tunica without any dissection. The epididymal fluid is aspirated using a 26-gauge needle; the epididymal fluid that continues to flow out of the punctured tubule upon needle withdrawal is also aspirated. The tubular opening is not closed. Epididymal fluid can be aspirated from different locations to maximize the number and quality of sperm retrieved.

Testicular Sperm Extraction (TESE)

This procedure is usually carried out without delivering the testis. Briefly a 2-cm transverse incision is made through the anterior scrotal skin dartos and tunica vaginalis. A small self retaining retractor can be used to ensure proper exposure of the tunica albuginea. A 1-cm incision is made in the albuginea and gentle pressure is applied to the testis to aid the extrusion of the testicular parenchyma. A fragment of approximately 5x5 mm is excised with sharp scissors and placed in sperm culture media (Figure 1). Single or multiple specimens can be extracted from the same incision. Alternatively individual albuginea incisions can be made in the upper middle and lower testicular poles in an organized manner for the sampling of different areas. The testicular specimens are sent to the laboratory for processing and immediate microscopic examination. The tunica albuginea is closed with a running non-absorbable suture.

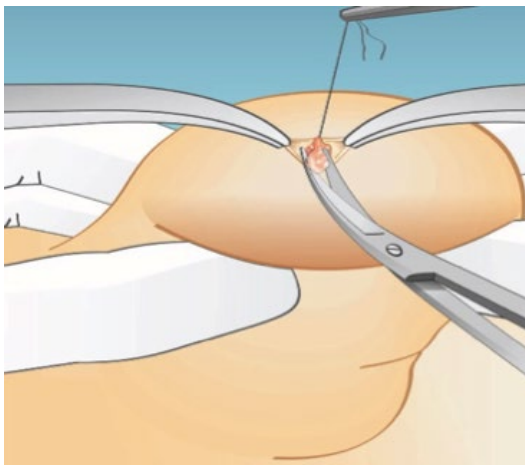

Figure 1 - Conventional testicular sperm extraction (TESE). The illustration depicts TESE using a single open biopsy

Single Seminiferous Tubule Biopsy

This technique is a variation of TESE. The scrotum is opened and the testis is exposed. An avascular area of the tunica is punctured with a 26-gauge needle. A microforceps tip is used to dilate the puncture site thus allowing a loop of seminiferous tubule to emerge. The seminiferous tubule is pulled out using the microforceps and sent for microscopic examination. If sperm are seen, additional tubule is pulled out from the same site. If no sperm are found or the tubule appears fibrous the procedure is repeated in a different area. Multiple sites can be sampled until sperm are found or the entire testicular surface has been explored. Albuginea openings are not sutured because these openings are very small.

Percutaneous Epididymal Sperm Aspiration (PESA).

The technical procedure for percutaneous epididymal sperm aspiration involves the insertion of a needle attached to a syringe through the scrotal skin into the epididymis (figure 2). Originally the use of a larger butterfly needle was described. Currently, most experts use a fine needle (26 gauge) attached to a tuberculin syringe containing sperm washing medium. After creating negative pressure by pulling the syringe plunger, the tip of the needle is gently and slowly moved in and out inside the epididymis until fluid is aspirated. If motile sperm are not obtained, PESA may be repeated at a different site (from the cauda to caput

epididymis) until an adequate number of motile sperm is retrieved. These aspirations are usually performed in the corpus epididymis and then in the caput epididymis if needed, as aspirates from the cauda are often rich in poor-quality senescent spermatozoa, debris and macrophages. Because PESA is a blind procedure multiple attempts may be needed before high-quality sperm are found. If PESA fails to enable the retrieval of motile sperm, testicular sperm retrieval can be attempted during the same operation.

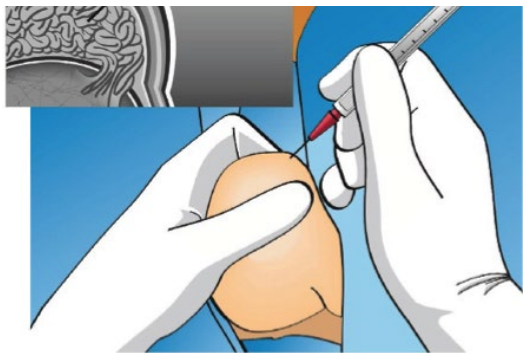

Figure 2 - Percutaneous epididymal sperm retrieval. The epididymis is stabilized between the index finger, thumb and forefinger. A needle attached to a tuberculin syringe is inserted into the epididymis through the scrotal skin, and fluid is aspirated

Testicular Sperm Aspiration (TESA) and Testicular Fine-Needle Aspiration (TEFNA)

In TESA a needle is inserted through the scrotal skin into the testis. The needle is usually inserted into the anteromedial or anterolateral portion of the superior testicular pole at an oblique angle toward the medium and lower poles. These areas are the least likely to contain major branches of the testicular artery running superficially underneath the tunica albuginea. These aspirations are usually carried out using either fine (testicular fine-needle aspiration; TEFNA) or large-diameter needles attached to a syringe. The testicular parenchyma is aspirated by creating negative pressure and the specimen is sent to the laboratory for microscopic examination. TESA can be carried out in the contralateral testis if an insufficient number of or no sperm are obtained during the first attempt. Alternatively testicular parenchyma can be obtained percutaneously using a tissue-cutting biopsy needle (e.g., a Tru-cutTM needle or BioptyTM gun). For this procedure the needle is placed against the testis and, upon release of the springer the needle enters the parenchyma, cuts a piece of tissue and withdraws it into a sheath. However testicular fine-needle aspiration (TEFNA) can also be applied for therapeutic sperm retrieval in cases of obstructive and non-obstructive azoospermia. The concept behind FNA is to map the testicle to direct biopsies to preidentified areas of sperm production thus facilitating sperm retrieval in cases of non-obstructive azoospermia (NOA). Depending on the size of the testis four to nine systematically placed aspiration sites are mapped (figure 4). FNA mapping is performed with a sharp-beveled 23-gauge fine needle attached to a 10-mL syringe coupled with a Cameco syringe holder. Suction is applied and the syringe holder is held steady as the needle is moved in and out within the testis with no change in direction. Twenty to 30 incursions are performed at a depth range of 8 to 12 mm. Suction is released before the needle is withdrawn from the testis. Tissue fragments are expelled from the needle onto a slide after air aspiration and fixed by immersion in 95% ethyl alcohol in the cases in which TEFNA is used for diagnostic purposes. In therapeutic SR tissue fragments are expelled into pre-identified tubes containing sperm media.

Table 4: Materials and instruments commonly used in sperm retrieval techniques.

Sperm retrieval method	Equipment and Supplies
All	**Basic instruments and materials:** • Unipolar coagulating generator (open retrievals) • Bipolar coagulating generator (MESA and micro-TESE) • Antiseptic solution for skin cleaning • 30-cc 1% xylocaine solution (spermatic cord anesthesia) • 19- (40x12) and 22- (25x7) gauge hypodermic needles (spermatic cord anesthesia) • Sterile towels • Gauze sponges • Sterile gowns • Surgical gloves • Surgical drapes • Surgery instrument table (optional) • Mayo table • Sterile drapes for tables • 20-cc syringes (spermatic and anesthesia) • Saline solution for irrigation (MESA and micor-TESE) • Unipolar cautery pen (MESA and micro-TESE; optional)
PESA, TESA AND TEFNA	• Sharp-beveled fine needle (19-, 22-, 23- or 26-gauge, depending on the surgeion's preference and technique) attached to a 1-mL, tuberculin syringe (PESA) or to a 10- or 20-mL syringe coupled to a Cameco (or similar) syringe holder • Tissue-cutting biopsy needle (e.g., Tru-cut™ needle or Biopty™ gun; optional)
TESE, micro-TESE, MESA, Open epididymal fine-needle aspiration, Single seminiferous tubule biopsy	**Non-microsurgical set:** • Basic set of surgical instruments for delicate surgeries (including small needle holder, small smooth and toothed forceps (Addison forceps), small suture scissors, small curved dissection scissors, a pair of small farabeuf retractors, scalpels, curved kelly clamps, straight mosquito clamps, backhauz clamps) • Sutures (e.g., 4-0 vicryl with tapered needle, 4-0 catgut with tapered needle, 5-0 black monofilament nylon with tapered cut needle (micro-TESE), 9-0 black monofilament nylon with tapered needle (MESA)
Micro-TESE and MESA	**Micorsurgical Set** • Straight non-toothed fine-tip forceps (13.5 cm long) • Curved non-toothed fine-tip forceps (13.5 cm long) • Non-locking needle holder with a rounded, finely curved tip • Pair of straight or curved blunt dissecting scissors • Bipolar cautery with fine-tipped forceps • Small retractor • Blunt, long and rounded irrigating needle • Microsurgical scalpel • Autoclavable case • Silicone tubing for protecting instrument tips
Micro-TESE and MESA	**Operating Microscope:** • Operating microscope equipped with 200-, 300- and 350-mm objective lenses and motorized operated zoom system • Note: The optical, mechanical and electrical microscope components should be checked before surgery to ensure that the operational conditions are adequate. A spare lamp should be readily available. A sterile microscope cover and/or handles should be available to allow for microscope adjustments during surgery.
All	**Reagents and Laboratory Supplies:** • Sperm culture media (kept at 37^0C) • 6-mL sterile centrifuge polystyrene tubes with caps • 60 x 15-mm center-well Petri dishes (micro-TESE)

PESA: percutaneous epididymal sperm aspiration; TESA: testicular sperm aspiration; MESA: microsurgical epididymal sperm aspiration; TESE: testicular sperm extraction; micro-TESE: microdissection testicular sperm extraction.

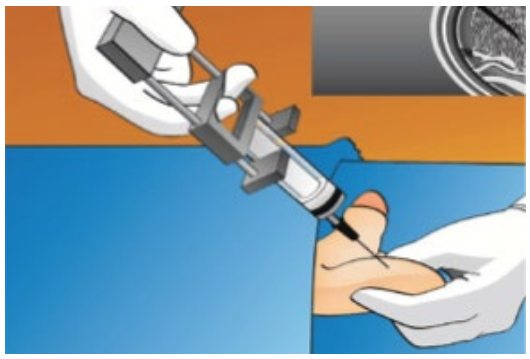

Figure 3 - Percutaneous testicular sperm aspiration. A 20-mL needle syringe connected to a Cameco holder is percutaneously inserted into the testis. Negative pressure is created, and the tip of the needle is moved within the testis to disrupt the seminiferous tubules and sample different areas. The testicular parenchyma is aspirated

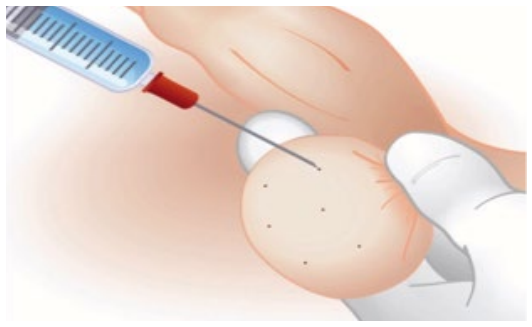

Figure 4 - Testicular fine-needle aspiration (TEFNA). A 23-gauge fine needle attached to a 10-mL syringe coupled to a Cameco syringe holder is percutaneously inserted into the testicle to map different areas. Negative pressure is applied, and the needle is moved in and out within the testis with no change in direction. A tissue fragment from each mapped area is expelled into a preidentified tube containing sperm culture medium.

Microsurgical Sperm Retrieval Methods

Microsurgical-guided sperm acquisition has been applied in both epididymal and testicular retrievals. The goal of microsurgical epididymal sperm aspiration (MESA) is to identify and open a single epididymal tubule to aspirate a sperm-rich, red blood cell-free fluid that can be used for fresh sperm injection or cryopreserved for a single or multiple later ICSI attempts. In microsurgical testicular sperm extraction the testicular parenchyma is dissected under magnification to search for enlarged seminiferous tubules, which are more likely to contain germ cells and foci of sperm production compared to non-enlarged or collapsed tubules. Such seminiferous tubules are removed rather than proceeding with the large single or multiple biopsies performed in conventional TESE. Microsurgical techniques and instruments including an operating microscope are used throughout both the MESA and micro-TESE procedures. MESA is indicated for cases of OA, whereas micro-TESE is recommended for the most severe cases of NOA.

Microsurgical Epididymal Sperm Aspiration (MESA)

This surgical technique requires testis delivery through a 2-3-cm transverse scrotal incision. The epididymal tunica is incised, and an enlarged tubule is selected. Then the epididymal tubule is dissected and opened with sharp microsurgical scissors. The fluid that flows out of the tubule is aspirated with the aid of a silicone tube or a needle attached to a tuberculin syringe (figure 5). The aspirate is flushed into a tube containing warm sperm medium and is transferred to the laboratory for examination. MESA can be repeated at a different site on the same epididymis (from the cauda to caput regions) and/or the contralateral epididymis until an adequate number of motile sperm is retrieved. If MESA fails to retrieve motile sperm, TESA or TESE can be performed as part of the same procedure. However, MESA often provides enough sperm for cryopreservation. A single MESA procedure usually enables the retrieval of a large number of high-quality sperm that can be used for ICSI or intentionally cryopreserved for subsequent ICSI attempts.

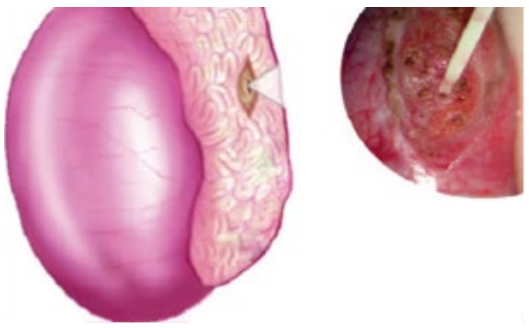

Figure 5 - Microsurgical epididymal sperm aspiration (MESA). After exposure of the testis and epididymis, a dilated epididymal tubule is dissected and opened. The fluid is aspirated, diluted with sperm medium and sent to the laboratory for examination

Microsurgical Testicular Sperm Extraction (micro-TESE)

For micro-TESE the scrotal skin is stretched over the anterior surface of the testis after which a 2-3-cm transverse incision is made. Alternatively a single midline scrotal incision can be used. The incision extends through the dartos muscle and the tunica vaginalis. The tunica is opened and identifiable bleeders are cauterized. The testis is delivered extravaginally and the tunica albuginea is examined. Then a single large mid-portion incision is made in an avascular area of the tunica albuginea under 6-8x magnification and the testicular parenchyma is widely exposed in its quatorial plane (figure 6). The testicular parenchyma is dissected at 16-25x magnification to enable the search and isolation of seminiferous tubules that exhibit larger diameters (which are more likely to contain germ cells and eventually normal sperm production) in comparison to non-enlarged or collapsed counterparts (figure 7). If needed the superficial and deep testicular regions can be examined and microsurgical-guided testicular biopsies are performed by carefully removing enlarged tubules using microsurgical forceps. If enlarged tubules are not observed any tubule that differs from the remaining tubules in size is excised. The excised testicular tissue specimens are placed into the inner well of a Petri dish containing sperm media, and are sent to the laboratory for processing and sperm search. The tunicas albuginea and vaginalis are then closed in a running fashion using non-absorbable and absorbable sutures. The dartos muscle is closed with interrupted absorbable sutures respectively. Immediately prior to complete closure 3 cc of 1% xylocaine solution may be injected into the subcuticular layers. The skin is closed using a continuous subcuticular 4-0 vicryl suture. A fluffy-type scrotal dressing and scrotal supporter are placed.

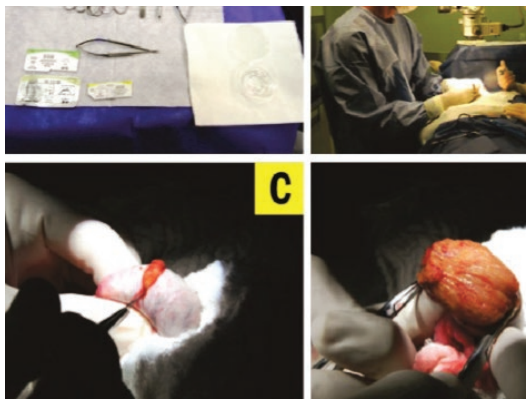

Figure 6 Microdissection testicular sperm extraction (micro-TESE). Microsurgical techniques and instruments (A), including an operating microscope (B), are used throughout the procedure. After testis exteriorization, a single large incision is made in an avascular area of the albuginea (C), and the testicular parenchyma is widely exposed (D).

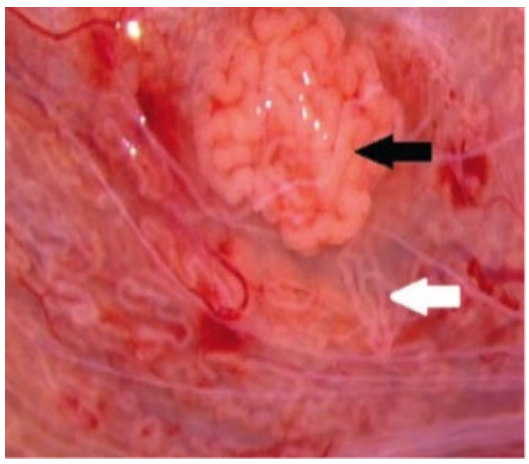

Figure 7 - Photograph showing the micro-TESE intraoperative aspect (256 magnification). The seminiferous tubules with enlarged diameters (black arrow) are likely to contain active spermatogenesis, while the thin tubules usually contain Sertoli cells only (white arrow).

POSTOPERATIVE CARE AND COMPLICATIONS OF SPERM RETRIEVAL

The vast majority of SR procedures are performed on an outpatient basis, with patients usually being discharged 2-3 hours after surgery. Patients should be examined for a scrotal hematoma prior to discharge. After percutaneous retrievals, patients often resume their normal activities on the following day. Bed rest and the application of an ice pack to the scrotum is recommended for the first 48 hours, especially following open retrievals. For these procedures patients are instructed to remove the scrotal dressing after 24 hours and are encouraged to take warm showers and wash the incision area with soap and water after 24 hours. Oral analgesics and non-steroidal anti-inflammatory medications are routinely used for 3-5 days. Postoperative antibiotics are not routinely prescribed. Patients are instructed to resume a normal diet and increase their daily activities to a normal level over a 3- to 4-day period. The use of a scrotal supporter is strongly recommended for approximately one week after the procedure. The patient should abstain from sports activities heavy lifting and sexual intercourse for approximately 10 days. After SR patients are advised to report any adverse signs and symptoms including fever persistent pain or swelling bleeding or excessive fluid leakage from the wound. A scrotal ultrasound may be indicated in cases with complications. The determination of hormone levels including total and free testosterone, FSH, LH, and estradiol, is recommended six months after open testicular retrievals.

The incidence of post-SR complications including persistent pain, swelling, infection, hydrocele, and hematoma, ranges from 0-70%. Intratesticular hematomas have been observed on ultrasounds performed three months after surgery in most patients (up to 80%) who undergo TESE with single or multiple biopsies but they often resolve spontaneously without compromising testicular function. Large-volume conventional TESE has been associated with a higher risk of a transient or even permanent decrease in serum testosterone levels due to testicular devascularization and excessive tissue removal. On the other hand the incidence of complications is lower following micro-TESE compared to conventional TESE. Nonetheless testosterone levels return to pre-surgical values in most individuals within 12 months following surgery. Given the potential serious postoperative complications of SR it is recommended that these procedures be performed by surgeons who have specific training in the above-mentioned techniques.

CONFERENCE ALERTS

NATIONAL

25th Annual meeting of the Indian Society for the study of Reproduction and Fertility and International Coference of Reproductive Health: Mumbai; 14-17 Feb

ISAR 2015: Chennai: 10-12 April 2015

Maharashtra Chapter of ISAR: Infertility to Maternity: 27-28 March 2015; Aurangabad

INTERNATIONAL

Fertility 2015 will be held at ICC Birmingham on 7-9 Jan 2015. This is the 9th Biennial Conference of the UK Fertility Societies.

The International Academy of Human Reproduction: 16th World Congress on Human Reproduction: 18-21 March 2015; Berlin, Germany

ESHRE 2015: 31st Annual meeting of ESHRE in Lisbon, Portugal, from 14 to 17 June 2015

MEDICAL TREATMENT OF OLIGO-ASTHENO-TERATOZOOSPERMIA

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INTRODUCTION

Approximately 10-15% of all couples of reproductive age groups eek fertility assessment. With a increasing population of working women and the associated delay in the ages of marriage and first child bearing, infertility services are being increasingly utilized (1). With the advent of assisted reproductive techniques and with the increasing success achieved, the evaluation of the male partner and an attempt at curative treatment is often overlooked. Male factor is involved in about half of the infertility cases. It is essential to identify the pathology and treat the male which may allow couples to improve their fertility potential and conceive through natural intercourse.

The new WHO guidelines on semen analysis (2) is exciting and make one wonder whether we have over treated the male partners previously . The oligo astheno terato spermia known as OTA syndrome is commonly encountered problem in male infertility.

TREATMENT OPTIONS IN OLIGOASTHENOTERATOZOOSPERMIA (OATS)

1. Medical therapy which may be general or specific
2. Surgical therapy
3. ART Intra Uterine Insemination or Intra Cytoplasmic Sperm Injection

IN THIS ARTICLE WE ARE COVERING ONLY THE MEDICAL MANAGEMENT OF OTA

Specific medical management of OATS is based on identifying reversible causes of infertility and treating them with appropriate medications to achieve a pregnancy. Despite the advancements in diagnostic methodology, no identifiable cause can be found in majority of infertile males. This is referred to as Idiopathic Oligo astheno teratozoospermia. These patients are treated with nonspecific empirical medications based on theoretical concepts, in an attempt to improve semen parameters and to improve fertility potential. Factors influencing the choice of medical therapy in OATS:

1. **Age of the couple and duration of infertility:** A young couple with a short trying time should be given the option of medical therapy in order to buy time to achieve a natural pregnancy. On the other hand, an older couple with a much longer trying time should be counseled to move towards ART.
2. Severity of OATS and realistic chances of improvement expected a patient with severe OATS (less than 5 million/ml with very poor progressive motility) with no obvious reversible factors is more likely to benefit from ART.
3. **Past illness causing irreversible damage:** For example, a patient who had post-mumps orchitis and testicular atrophy, or who was operated for undescended testes. In such patients, it is unlikely that medical therapy will help.
4. **Reversible, correctable gonadotoxic factors?** If there is occupational exposure to gonadotoxins (heat, chemical fumes), heavy smoking, recent febrile illness, accessory gland infections, etc., then such patients can be given supportive medical therapy to buy time for improvement of semen parameters once the gonadotoxic factors are eliminated/modified.
5. **Treatment history is imperative.** It's important to know what drugs a patient has already tried in the past (whether they were effective or not) so there is no repetition. If various drugs have already proved Ineffective there is no point in giving further medical therapy.
6. Socioeconomic status of the couple should also be considered when deciding medication since many empirical drugs are rather expensive.
7. Psycho-social pressures on the couple play an important role in decision making. In a couple who is socially hard-pressed for a baby, less time should be spent on medical therapy.

SPECIFIC MEDICAL THERAPY

With history, physical examination and specific investigations, it is possible to diagnose and treat certain specific medical conditions that will contribute to OATS.

- **Chronic Scrotal Fungal Dermatitis:** This can affect fertility by thickening the scrotal skin and thus increasing the local temperature. This is treated with topical antifungal plus steroid creams.
- **Genital Tract Infection:** The World health organization (WHO) defines leucocytospermia as seminal white blood cells (WBC) levels more than or equal to 1 X 106 /ml (WHO 1999) with the prevalence among male infertility patients being about 10-20%.The clinician must ensure that the laboratory should clearly differentiate between leucocytes and immature germ cells using cytologic staining or immune-histochemical techniques. All men with elevated seminal WBC levels (>1 x 106/mL) should be evaluated for a genital tract infection or inflammation, and a semen culture should be performed. Common organisms responsible are Streptococcus fecalis and Escherichia coli, Chlamydia trachomatis (3) and Ureaplasma urealyticum. Because of the difficulty of culturing Chlamydia or ureaplasma we often give Doxycycline 100 mg/day on an empirical basis for 15 days and then start antibiotics as per culture reports. Commonly used are: Fluoroquinolones 0.5 to 1 g/day, Cotrimoxazole (Sulfamethoxazole 800 mg, Trimethoprim 160 mg) or Erythromycin 1.5 gm/day. These drugs are administered for 2 to 3 weeks along with advice of frequent ejaculation. It is also a better option to rotate the antibiotics. However, culture-negative patients with proven leucocytospermia should be treated with anti-inflammatory therapy and frequent ejaculation because empiric antibiotic therapy generally provides no benefit and may be harmful. In cases of refractory leucocytospermia, sperm washing can be performed before intrauterine insemination to remove the white cells.
- **Immunologic Infertility:** Oral prednisolone is commonly used to suppress antibody production, but no double-blind, randomized trial has confirmed their efficacy. Studies following different protocols report pregnancy rates between 0 to 44%. Studies in which treatment was continued for more than 3 months reported a significant increase in the number of pregnancies amongst those receiving prednisolone compared with placebo (4).

  ICSI is considered to be the treatment of choice for patients with severe sperm autoimmunity. Recently, higher fertilization rates during in vitro fertilization (IVF) were reported in patients with antisperm antibodies and immunosuppressive therapy compared to IVF without immunosuppressive therapy. Therefore treatment of antisperm antibodies using corticosteroids should not be prescribed routinely, but it can be considered in patients with antisperm antibodies and earlier failed fertilization during IVF or ICSI. High doses of prednisolone should be avoided even on short term due to the rare but catastrophic risk of avascular necrosis of femoral head. It is recommended to use tablet prednisolone 5 mg, thrice-a-day for 10 days, then twice-a-day for 10 days, then once-a-day for 10 days.
- **Chronic Epididymo-Orchitis:** Many subfertile men have clinical evidence of chronic filarial epididymo-orchitis residence in an endemic area, enlarged adherent epididymis, thickened cord, lax hydrocoele, h/o hydrocoele surgery, h/o testicular swelling with fever, and occasionally ultrasound evidence of the "filarial dance". Such men sometimes show good improvement in semen parameters after a course of anti-filaria therapy (DEC lOO mg thrice-a-day for 20 days in combination with Doxycycline lOO mg twice-a-day for 10 days) followed by low dose steroids as given above.

NONSPECIFIC OR EMPIRICAL THERAPY

In patients with idiopathic OATS, a variety of empirical medical therapies (5) have been recommended. Although there are numerous reports that support a multitude of compounds, the vast majority are nonrandomized studies and unfortunately no medical therapy has demonstrated consistent efficacy in multiple, rigorous, well-controlled, randomized, placebo controlled trials. Because of isolated case reports and small series demonstrating efficacy of some agents, there is continued hope that they may be effective in select subpopulations of men with idiopathic reproductive dysfunction.

Non-specific treatments (5) include

A. *Hormonal agents:* Androgens, Antiestrogens, Aromatase inhibitors, Gonadotropins.
B. *Antioxidants:* Glutathione, Lycopene, Vitamin-E
C. Sperm vitalizes: L-carnitine,Co-enzymeQ10
D. *Nutritional supplements:* Folic acid, Zinc, Multivitamins, Trace elements
E. *Miscellaneous:* Indomethacin, Kallikrien, Low dose corticosteroids.
F. Elimination of gonado toxic factors

HORMONAL AGENTS:

Androgens

Rationale

Direct therapy: Exogenous androgens, administered at a dose that will not influence the pituitary-gonadal axis, may have a direct stimulatory effect on spermatogenesis or influence sperm transport and maturation through an effect on the Epididymis, Vas deferens and Seminal vesicles.

Drugs used and dosage

Direct therapy: Mesterolone 25mgthrice daily; Testosterone undecanoate (6) 40mg two to four capsules daily,

Rebound therapy: High doses of exogenous androgens will suppress the H-P-T axis and result in azoospermia. Subsequently, after cessation of

androgens, the gonadotropin levels will rise again, during which period there may be a rebound increase in sperm counts above baseline.

Rebound therapy: has been given up because of uncertain results and risk of permanent azoospermia

Antiestrogens (7)

Rationale: Antiestrogens inhibit the negative feedback effect of estrogen by blocking estrogen receptors in the hypothalamus, which in turn increases endogenous gonadotropin secretion. In turn, FSH and LH stimulate Sertoli and Leydig cells with a possible improvement in spermatogenesis

Drugs used and dose:

i. Clomiphene citrate: 25mg daily, or on alternate days
ii. Tamoxifen citrate: 10 to 20 mg daily

AROMATASE INHIBITORS

Rationale: Estrogen has a potent negative feedback effect on gonadotropin secretion. Obese men have excessive aromatization, in their fat cells, of Testosterone to Estrogen resulting in excess estrogen and an altered Testosterone to Estrogen ratios (T/E). Aromatase inhibitors correct this by inhibiting the peripheral conversion of Testosterone and may thereby enhance spermatogenesis.

Drugs used and dose:

Letrozole 2.5mgdaily orally

Gonadotropins

Rationale: Some patients with idiopathic infertility may have a subclinical endocrinopathy which results in abnormalities in the bio-activity, half-life or pulsatility of gonadotropin secretion.(8) Such men may benefit from exogenous gonadotropins despite normal levels on immunoassay.

Drugs used: Human chorionic gonadotropin (HCG) (1500 IU i.m 3 times per week), Human menopausal gonadotropin (HMG) (37.5-75 IU i.m 2 times per week),

Antioxidants : (9)(10)

Rationale: Elevated seminal Reactive Oxygen Species (ROS) levels have been recognized as an independent marker of malefactor infertility, irrespective of whether patients have normal or abnormal semen parameters. Spermatozoa are particularly susceptible to oxidative stress- induced damage. Antioxidants in seminal plasma are the most important form of protection available to spermatozoa against ROS. Many studies (9) have supported the use of exogenous antioxidants in the treatment of idiopathic infertility.

Drugs used and dose: Glutathione 250mg daily (50-600mg/day), Lycopene 4-8 g daily, Vitamin E 400 to 800 mg daily.

Sperm Vitalize:

Rationale: Act through varying mechanisms with a common end-point of energizing the sperm and making them more capable of fertilization. They may have a role in sperm maturation during the transit through the epididymis. Some of them have an antioxidant action in addition (5).

Drugs used and dose: L-Carnitine and Acetyl Carnitine 1 g, thrice-a-day;

Coenzyme Q10 100-300 mg per day.

Nutritional Supplements (9)

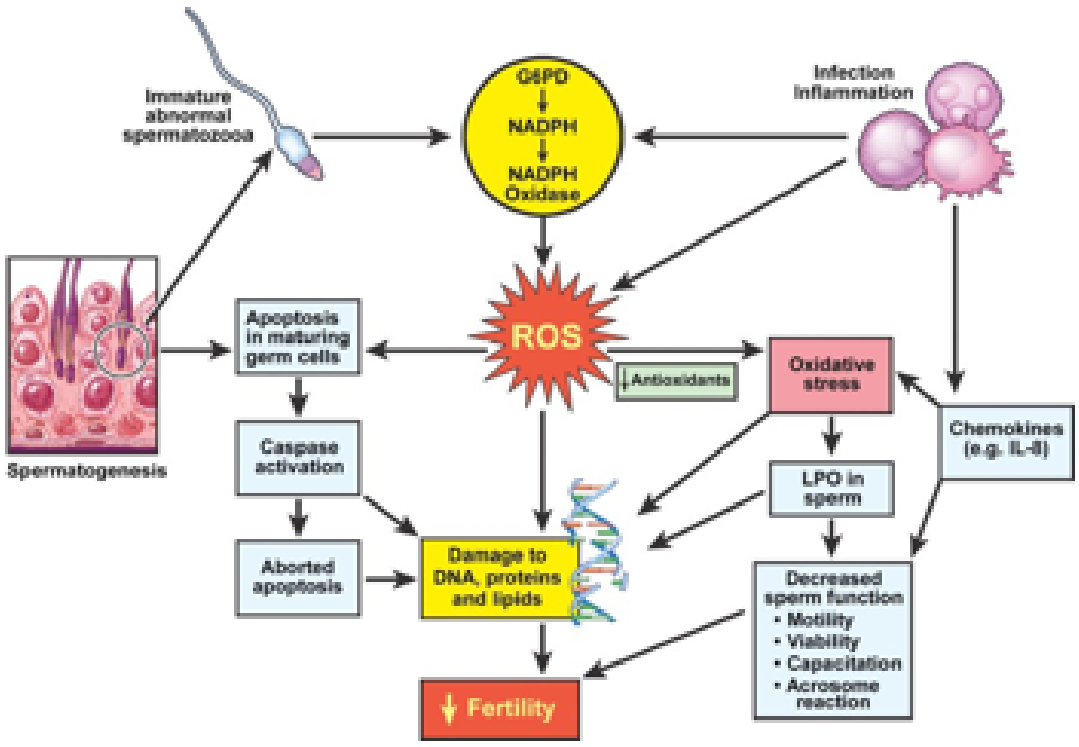
Rationale: In our country, majority of the people from the lower socioeconomic strata are nutritionally depleted and therefore may not have the necessary levels of vitamins and trace elements to facilitate spermatogenesis.

Drugs used: multivitamin combinations with zinc, selenium, folic acid, and B12. Various combinations of neutraceutical are available (10).

Miscellaneous:

Rationale: Some of these therapies have aimed at improving sperm quality by boosting the Kallikrein-Kinin system(Kallikriens) or by interfering with the production of prostaglandins (Phosphodiesterase inhibitors, Nonsteroidal anti-inflammatory agents)

Drugs used: Kallikriens 600IU daily; Indomethacin.
Elimination of Gonadotoxic Factors



Elimination of chronic exposure to heat at the workplace (furnace, kitchen, etc) or in leisure activities (sauna, steam bath), cessation of heavy smoking, avoidance of exposure to pesticides (DDT spray) or chemical fumes (aromatic amines), reduction of excessive stress, regularization of diet and lifestyle can also help some men significantly.

CONCLUSIONS:

As physicians taking care of couples with OATS, it is our duty to give the patients a very clear road map of their course of therapy.

Therapy must be individualized and it is mandatory that a treatment timeline and endpoints be established prior to initiation of medical therapy (11).

When empiric pharmacologic therapy is going to be used, treatment should last at least 3 months to incorporate a full 74-day spermatogenic cycle, and should be followed by a semen analysis.
If there is significant improvement then the medications should be continued and further improvement monitored monthly. If there is no improvement then the medication should be changed or the therapy may be escalated to ART. Patients must be counseled regarding the inconsistent response to medical therapy and to have realistic expectations from the same.

Most importantly, we must not be guilty of wasting precious time and money over medical therapy when the circumstances call for assisted reproductive therapy.

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COMMENTARY

MALE INFERTILITY

DR. GITA KHANNA, LUCKNOW

Male infertility is on rise...whether more men are submitting themselves to diagnosis and treatment or male infertility is actually rising courtesy the stress of lifestyle factors and environmental factors or both. In a 1982 to 1985 World Health Organization (WHO) multicenter study, 20 percent of cases were attributed to male factors, 38 percent to female factors, 27 percent had causal factors identified in both partners, and 15 percent could not be satisfactorily attributed to either partner.

It is therefore essential that the female partner be thoroughly investigated and treated while the male partner is being evaluated. Treatment of the female partner can often compensate for male factor subfertility due to mild to moderate decreases in semen parameters, resulting in pregnancy without treatment of the male.

Until lately, management of male factor infertility was a frustrating experience for both clinician and patient because of poor understanding of the pathogenesis of and an inability to treat most cases of male infertility. The development of assisted reproductive techniques (ART) has improved the outlook for many couples with male factor infertility. These techniques, however, are complex, invasive, expensive, and often unsuccessful.

THERE ARE FOUR MAIN CAUSES OF MALE INFERTILITY:

- Hypothalamic/pituitary disease (secondary hypogonadism) – 1 to 2 percent
- Testicular disease (primary spermatogenesis failure and hypogonadism) – 30 to 40 percent
- Posttesticular defects (disorders of sperm transport) – 10 to 20 percent
- Nonclassifiable – 40 to 50 percent

Male fertility studies should include a control group because even untreated men who have subnormal semen parameters, unless they are entirely azoospermic, can sometimes impregnate their female partners. As a consequence, pregnancy can occur independent of treatment and false positive results occur in clinical studies that do not use a placebo control group. Use of at least three semen specimens over a period of time, eg, six weeks, may diminish this phenomenon, but is still not as good as pregnancy as the principal criterion of fertility.

Many medical and surgical procedures have been reported to improve male fertility only to be shown subsequently to be ineffective. The two principal reasons for the initially promising but ultimately misleading reports are:

a) the use of semen quality, rather than pregnancy, as the criterion of success and

b) the failure to include a control group in the trial.

The current methods of therapy are divided arbitrarily into the following categories:

- limited treatment,
- specific treatment,
- treatment of uncertain efficacy,
- empirical treatment,
- and treatment by assisted reproductive techniques

There are a variety of causes of irreversible male infertility for which no therapy is available. As an example, there is no known therapy that will stimulate sperm production when the seminiferous tubules have been severely damaged. Conditions that are often associated with such severe damage are Klinefelter syndrome, microdeletions of the Y-chromosome, Sertoli cell only syndrome, and idiopathic infertility associated with azoospermia. In certain cases, if mature spermatozoa or spermatids are found in the testicular biopsy, they can be retrieved and used to fertilize oocytes in vitro, resulting in pregnancies in the partner using ART. Successful fertility has been achieved in some patients with Klinefelter syndrome and Sertoli cell only syndrome (as also with azoospermic men with maturation arrest, defective spermiogenesis, deletion of the DAZ gene, and in men with long-standing azoospermia after chemotherapy) using testicular sperm retrieval and intracytoplasmic sperm injection (ICSI). However, there are important genetic implications of these.

Hypogonadism can be treated with testosterone. While not enhancing fertility potential, such men will greatly benefit from androgen replacement by improvement in sexual function and mood, and an increase in or maintenance of bone and muscle mass.

Specific endocrine treatment is available only for men whose infertility results from hypogonadotropic hypogonadism. If this results from hyperprolactinemia, it can often be corrected and fertility restored by lowering the serum prolactin concentration.

- If the hyperprolactinemia results from a medication, that medication should be discontinued, if possible.
- If the hyperprolactinemia results from a lactotroph adenoma, the adenoma should be treated with a dopamine agonist, such as cabergoline or bromocriptine. Normal spermatogenesis takes three months. As a result, restoration of a normal sperm count usually does not occur for at least three and sometimes six months or more after the serum prolactin and testosterone concentrations have returned to normal.

Permanent damage to the gonadotroph cells by the mass effect of the macroadenoma maynot be corrected by dopamine agonist. Gonadotropin treatment should be instituted if fertility is desired. Treatment is initiated with human chorionic gonadotropin (hCG), 1500 to 2000 IU three times per week subcutaneously or intramuscularly for at least six months. The hCG dose should be adjusted upward according to symptoms of hypogonadism, serum testosterone concentrations, and semen parameters. Some patients with acquired hypogonadotropic states can be stimulated with hCG alone to produce sufficient sperm. If after six to nine months the patient remains azoospermic or severely oligospermic, then human menopausal gonadotropin (hMG) or recombinant follicle-stimulating hormone (FSH) should be added. Pulsatile subcutaneous or intravenous treatment with GnRH has also been successful in patients with hypothalamic disease. GnRH has to be delivered in pulses using a portable pump with an attached catheter and needle for many months or years; most patients find it inconvenient to use GnRH therapy for so long.

In a World Health Organization (WHO) study of over 9000 men who were partners in an infertile couple, a varicocele was much more common in men with abnormal semen (25.4 versus 11.7 percent with normal semen). The causal relationship between varicocele and male infertility has been ascribed to increased testicular temperature, delayed removal of endogenously derived toxic materials and metabolites, hypoxia, and stasis.

ICSI is a better answer to anti-sperm antibody than high doses of prednisolone (due to side-effects). Results with ICSI are not influenced by either the cause of the azoospermia or the origin of the spermatozoa. As such, infertility due to male factor seeks better prognosis with ICSI.

SPERM CHROMATIN DISPERSION TEST TO EVALUATE UNEXPLAINED INFERTILITY IN MEN

DR. KUMUD PASRICHA, JALANDHAR

Sperm DNA fragmentation is being increasingly recognized as an important cause of unexplained infertility. The assessment of sperm chromatin integrity has emerged as an important biomarker for male in unexplained infertility. The sperm chromatin dispersion test is a novel assay for sperm DNA fragmentation in infertile males with normal semen parameters. This test is less complex and has reached technical maturity by using bright field microscopy males with normal sperm parameters, nonsmokers and those not taking any medicine and those who has completed his evaluation by consulting urologist.

SPERM CHROMATIN DISPERSION METHOD

The SCD test is based on the principal that sperm with fragmented DNA fail to produce the characteristic halo of dispersed DNA loops that is observed in sperm with non fragmented DNA, following acid denaturation and removal of nuclear proteins. This is confirmed by the analysis of DNA fragmentation using the specific DNA breakage detection fluorescence in situ hybridization, which allows the detection of DNA breaks in lysed sperm nuclei. The test is performed with halo sperm kit. Sperm with damaged DNA (SCD +ve cells) show small haloes of dispersed chromatin or no haloes while sperm containing non damaged DNA show large or medium sized haloes of dispersed chromatin.

DISCUSSION

The SCD test is more sensitive than the tunel assay for the assessment of DNA damage in men with unexplained infertility. SCD may discriminate men with normal and abnormal sperm DNA damage with upto 70% accuracy. SCD test is a simple, accurate highly reproducible and inexpensive method for the analysis of sperm. Therefore the SCD test could potentially be used as a routine test for screening of sperm DNA fragmentation in andrology lab.

TECTICULAR SPERM EXTRACTION: A NEW HORIZON FOR BOTH OBSTRUCTIVE AND NON OBSTRUCTIVE AZOOSPERMIA

DR NIKITA NAREDI, DR SEEMA RAI, DR NAGRAJA N

The treatment of Azoospermia has undergone a radical change over the past 17 years, evolving

from a clinical diagnosis with no direct corrective options to a highly treatable entity. However, Intracytoplasmic Sperm Injection (ICSI), which was introduced in 1992, eliminated many obstacles in the way of fatherhood for men with severe male factor infertility and can help 95% of azoospermic men father their own genetic child without using donor sperm. This dramatic change in the management of male infertility was possible only with the advent of advanced surgical epididymal and testicular sperm retrieval techniques. These two major technical advances changed the treatment of untreatable testicular failure or unreconstructable obstructive azoospermia from "replacement" therapies in the form of donor insemination or adoption for the affected men to have a biologic child of their own.

There are various Sperm retrieval techniques which aid in obtaining spermatozoa from the epididymis and testes of azoospermic men seeking paternity. These collected sperm are then used for ICSI in the same cycle or alternatively, cryopreserved for future use.

The method of choice for sperm retrieval is based on the type of azoospermia, which can be obstructive or non-obstructive, and the surgeon's preferences and experience. Spermatozoa can be retrieved from the epididymis or testes in almost all cases of obstructive azoospermia (OA), irrespective of the technique and the cause of obstruction. Non-obstructive azoospermia (NOA), on the other hand which is a consequence of spermatogenic failure due to various congenital and acquired causes affecting 10-15% cases of azoospermic men, have no treatment options other than attempting testicular sperm retrieval. In such cases, spermatogenesis may be focal, and spermatozoa can be retrieved and used for ICSI. Testicular sperm extraction (TESE) is thus the technique of choice for NOA.

The goals of any surgical retrieval techniques are to: obtain the best quality sperm; retrieve adequate number of sperm for both immediate use and cryopreservation; minimize damage to the reproductive tract so as not to jeopardize future attempts at retrieval. These apply to TESE too. Historically, TESE was first carried out by Silber et al and Devroey et al in 1993 to men with obstructive azoospermia with a destroyed epididymis or with bilateral absence of the vas deferens. More recently TESE and direct sperm aspiration are advocated as alternative sperm recovery methods likely to yield spermatozoa even in patients with NOA having focal spermatogenesis. Thus in NOA or extreme oligoasthenoteratozoospermic men having severe hypospermatogenesis, bilateral maturation arrest in spermatogenesis, Sertoli cell-only syndrome or tubular fibrosis, the testes are the only source of spermatozoa. TESE in a clinical setting is carried out in: in obstructive azoospermia where microsurgical epididymal sperm aspiration (MESA) is impossible due to totally destroyed epididymis; in OA where reconstructive surgical options not viable; failure to retrieve spermatozoa by other retrieval techniques on the day of oocyte recovery in an IVF cycle; NOA due to various causes; anejaculation (penile vibrostimulation or electro ejaculation has failed or is not available).

A conventional Testicular sperm extraction is carried out by a standard open surgical biopsy technique where testicular parenchyma is removed without delivering the testis and without the aid of optical magnification. It is carried out as an outpatient procedure under local or loco regional anaesthesia. The surgical procedure is not without complication and may be associated with: persistent pain, swelling, infection, hydrocele, and hematoma formation.

Chances for sperm retrieval from TESE in relation to various clinical and endocrine parameters are summarized in the Table below. Higher fertility rates are achieved in OA than in NOA patients, with birth rates of approximately 47% and 21%, respectively.

Preoperative prognostic factor	Probability
Clinical obstructive azoospermia	100%
Partial disruption of spermatogensis (AZFc deletion)	75%
History of cryptorchidism	74%
History of hypogonadotrophic Hypogonadism	73%
Klinefelter syndrome	57%
Small testicles (High FSH values)	24%
Complete disruption of spermatogensis (AZFa, AZFb deletions)	0%

Testicular sperm retrieval which is a highly feasible and a successful procedure can help in spermatozoa retrieval from the testis in up to 70% of patients, even in cases with testicular failure and severe disorders of spermatogenesis. Thus infertility experts with very limited options in their repertoire for infertile men can fulfil their dream of fatherhood (fig 1-4).

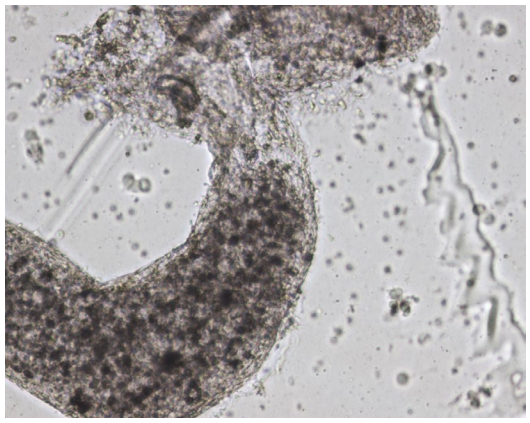

Figure 1 - Semineferous tubules after teasing

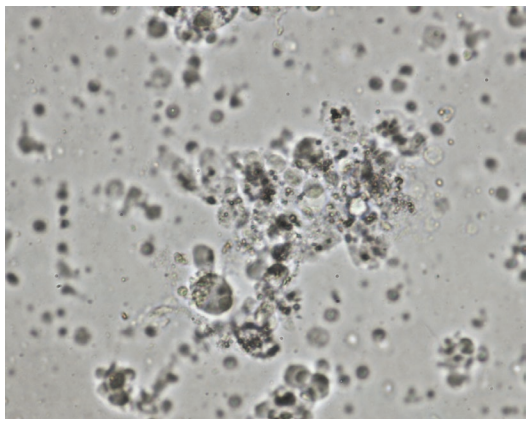

Figure 2 - Fibrosed tubules with negative outcome

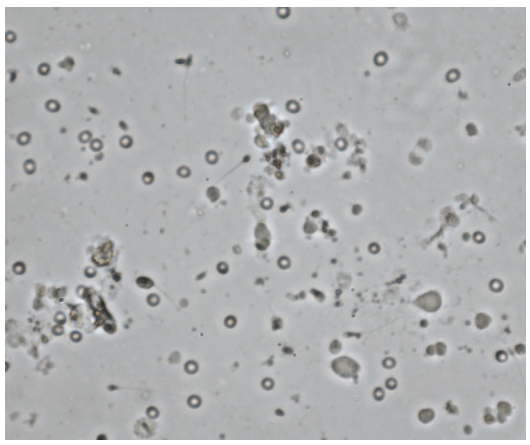

Figure 3 - Few alive spems seen in the specimen

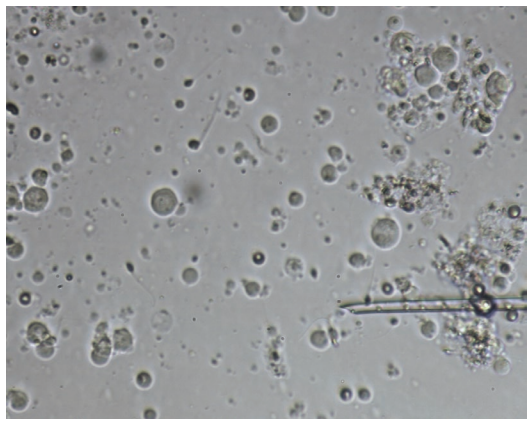

Figure 4 - ICSI being attemped

SMOOTH ENDOPLASMIC RETICULUM POSITIVE OOCYTES AND PREGNANCY OUTCOME

DR R SUJATHA, KODUNGALLUR

Smooth endoplasmic reticulum aggregates are pronuclei sized translucent vacuoles found in the oocyte cytoplasm. Presence of SER is shown to negatively affect assisted reproductive technology outcome. Study on 5516 embryos reported that the degree of blastocyst expansion and hatching status of blastocysts were decreased by the presence of SER. The inner cell mass quality was also found to be affected by SER. Several other studies indicated high incidence of obstetric problems in pregnancies resulting from the transfer of SER positive gametes. Several neonatal abnormalities were also reported in SER positive pregnancies. It was strongly recommended to avoid transfer of even the sibling oocytes without SER. Alpha scientists in reproductive medicine and ESHRE special interest group embryology suggested avoidance of embryo transfer in cycles affected with SER. However few recent studies have shown that though compromised fertilisation and implantation rates were observed, no impact was seen in post implantation development and neonatal outcome. This inference was from the data pertaining to 2158 patients. A review of SER positive cycles published in literature until 2013 showed that 171 healthy babies were born from SER positive cycles, out of which 22 were from SER positive oocytes.

In somatic cells SER contributes to lipid metabolism, synthesis of steroids and calcium release. In human oocytes, SER are present in two forms, the isolated vesicular SER which is distributed throughout the ooplasm and large aggregates of smaller elements present in the peripheral region. Ultra structural analysis of SER positive oocytes showed that the SER were surrounded by abnormal shaped mitochondria and clusters of small dense bodies formed by very small vesicles and had curvilinear dense tubules in the interior. Few reports suggest the presence of SER aggregates due gonadotropin hyper stimulation, because these forms have never been observed in germinal vesicle oocytes aspirated from antral follicles in nonstimulated ovaries. Large a SERT may be recurrent and appeared to be related with higher E2 and antimullerian hormone levels. Levels of serum estradiol on the day of HCG administration was significantly higher in SER positive cycles.

SER can be classified into large (18um), medium (10-17 um)which are visible under light microscope. The smaller SER s of 2-9um are not visible by light microscopy. It has also been shown that medium

sized SER grew to large SER in culture. Though the mechanism by which SER is formed is unknown, the above information suggests common origin for all SER types. In human oocytes, localisation of mobilisable calcium was found in the small vesicles beneath the plasma membrane of SER, hence aggregation of SER can have a direct role in calcium release and further downstream events involve calcium signalling.

Since conflicting and scanty data exist in literature regarding the effect of SER, a retrospective analysis was done at CRAFT hospital and research centre. In the present study pregnancy outcome was analyzed in 154 ser + cycles performed between 2008-2009. SER positive patients were divided into 4 groups: <10% of retrieved oocytes were SER positive (group A), 10-25% of retrieved oocytes were SER positive (group B), 25-50% of retrieved oocytes were SER positive (group C),and >50% of oocytes were SER positive (group). Differences were assessed in terms of age, serum estradiol and progesterone concentration on the day of hCG administration and clinical outcome in all the groups.

In group A pregnancy outcome was 54.2%, group B 44.3%, group C 43.7% and in group D there were no deliveries.

In our study we found that presence of ser does not hinder with pregnancy and live birth rates when the percentage of ser oocytes per cohort is is less than 50%. There were no significant differences in the hormone levels and the percentage of SER oocytes. There was no significant correlation between percentage of ser oocytes and age. Therefore, transfers of embryos from ser cohort can be carried out with caution. However long term monitoring of the children is also warranted.

SURGICAL TREATMENT OF MALE INFERTILITY IN THE ERA OF INTRACYTOPLASMIC SPERM INJECTION - NEW INSIGHTS

DR SANJAY MAKHWANA, JODHPUR

Infertility affects approximately 15 % of couples desiring conception, and male infertility underlies almost half of the cases. Two major breakthroughs occurred in the area of male infertility with regard to treatment, The first was the development of microsurgery which increased success rates for reconstruction of the reproductive tract. The second was the development of intracytoplasmic sperm injection (ICSI) and the demonstration that spermatozoa retrieved from either the epididymis or the testis were capable of fertilization and pregnancy.Varicocele can be diagnosed in up to 35% of infertile men.1 It is currently recommended that treatment should be offered to couples with documented infertility whose male partner has a clinically palpable varicocele associated with an abnormal semen analysis.Men with clinical varicoceles presenting with azoospermia may be candidates for surgical repair, but genetic evaluation including Giemsa karyotyping and polymerase chain reaction screening for Yqmicrodeletion of the AZFa, AZFb, and AZFc regions is recommended. A testis biopsy (open or percutaneous) provides testicular histology, which has been shown to be the only significant prognostic factor for the restoration of spermatogenesis in azoospermic individuals with varicocele. Open microsurgical inguinal or subinguinal techniques are currently the best treatment modalities because they result in higher spontaneous pregnancy rates and fewer recurrences and postoperative complications than laparoscopic, radiologic embolization and macroscopic inguinal or retroperitoneal varicocelectomy techniques. There are no absolute predictive factors for successful varicocele repair, and existing evidence does not support the treatment of infertile men with subclinical varicocele. Surgical repair of varicocele improves semen parameters and functional markers of oxidative stress and DNA integrity. The chance for either spontaneous or assisted conception is increased after the repair of clinical varicocele. In addition, recovery of spermatogenesis can be achieved after the repair of clinical varicocele in infertile men with NOA. Testicular histopathology is predictive of success, and men with MA and HS are more likely to ejaculate motile spermatozoa after surgery. Furthermore, the chance of retrieving testicular sperm for ICSI is optimized in nonobstructedazoospermic men with treated clinical varicocele.Both microsurgical reconstruction and sperm retrieval combined with IVF/ICSI can be effective treatments for infertility due to obstructive azoospermia. A choice between the two must be based not only on the needs and preferences of the individual couple but also on the couple's clinical profile (i.e., taking into account the cause of azoospermia and any coexisting factors in the female partner). Consequently, both partners should be evaluated thoroughly before making a specific treatment recommendation. Cost issues also play a role in the decision-making process because ART is seldom reimbursed by health insurance companies in most countries. According to the most recent data, microsurgical reconstruction of the vas (when performed by an experienced microsurgeon) remains a cost-effective and reliable means of restoring fertility in the majority of men who have previously undergone vasectomy.Vasovasostomy (VV) and vasoepididymostomy (VE) are designed to bypass an obstruction in the male genital tract. The number of men seeking vasectomy reversal due to changes in marital status or reproductive goals has increased and varies from 2-6%.Men with OA may father children either by surgical correction of the obstruction, which may allow the couple to conceive naturally, or retrieval of sperm directly from the epididymis or testis, which is followed by ICSI. The return of sperm to ejaculate after microsurgical reconstructions is achieved in 70-95% of cases, and 30-75% of couples achieve unassisted pregnancy.In OA, sperm production is normal and gametes can be easily retrieved from the epididymides or testicles in approximately 100% of cases, irrespective of the technique. In NOA, successful sperm retrieval is approximately 50%. The use of microsurgery during TESE may improve the efficacy of sperm extraction with significantly less tissue removed, which ultimately facilitates sperm processing. Testicular histology results, if available, may be useful to predict the chances of retrieving sperm in men with NOA. Interestingly, sperm can be obtained in almost all scenarios except cases of Y chromosome infertility with complete AZFa and/or AZFbmicrodeletions. In both OA and NOA, the sperm retrieval technique itself does not seem to impact IVF/ICSI success rates. Nonetheless, the chances of retrieving spermatozoa and of achieving a live birth by ICSI are increased in couples whose male partner had OA rather than NOA. Children conceived using sperm retrieved from men with OA or NOA should be monitored because it is still unclear if there is an increased risk of birth defects when ICSI is carried out with nonejaculated sperm.

COULD TIME-LAPSE EMBRYO IMAGING (TLM) REDUCE THE NEED FOR BIOPSY AND PGS?

Dr RANDHIR SINGH, BHOPAL

Non-invasive means to assess embryonic aneuploidy, such as morphokinetic timings, would be a powerful tool.While TLM has the potential to revolutionize clinical embryology, Only one study demonstrated significantly improved clinical pregnancy rates when embryos were selected by TLM in addition to conventional morphology. Prospective studies are currently underway and hopefully will clarify the role of TLM.

Furthermore, future studies must publish complete datasets in an effort to define patient-specific algorithms with the clinically meaningful end-point of implantation, prior to routine adoption in the assisted reproduction technology laboratory. Until such evidence accumulates, selection of embryos by TLM should remain an optional experimental strategy subject to institutional review and approval.

Of course, we all want the field of IVF to advance and to be able to offer the best possible treatment to our patients but most of all we must perform good medicine and do the necessary studies before bringing new techniques into routine clinical practice.

However, the field of IVF continues to develop new technologies to try to improve treatments and delivery rates. Sadly, many poorly designed experiments are published and reported in the media and desperate patients then demand these novel, unproven treatments. Perhaps, it is time to put the brakes on and examine the scientific work that has been performed on new technology and ask the questions; has the technique been validated and is there evidence to show that it has clinical significance?

GADGET WATCH

PLANNING TO UPGRADE YOUR EMBRYOLOGY LAB

BY DR (COL.) PANKAJ TALWAR
Professor and HOD ART Centre, R & R Hospital, Delhi

TRIPLE GAS TABLETOP INCUBATOR

	ESCO	K Systems	Planar (Origio)	Cook
Brand	Miri® Multi-room Incubator for IVF	G210	BT-37	K-minc 1000 incubator
Country	Denmark	Denmark	Denmark	Australia
No of Dishes (60 mm/ 4 well)	24	20	08	08
Gas CO2/ N2	Gas Mixture inbuilt	Gas Mixture inbuilt	Pre mix gas concentration required	Pre mix gas concentration required
Heated Lid	Present	Present	Present	Present
Chambers Provided	06 (each can accommodate 4 – Four well / 60 mm plates)	10, one for each 4 – Four well/60 mm-individual plate.	02	02
Controlled parametres display	Independent 06 Chamber control of temp with gas concentration display	Independent 10 Chamber control of temp with gas concentration display	Only temp Controller (7 sensors for temp)	Only temp Controller
UV/ VOC Filter	Present	Present	Not present	Not present
Media warming /gassing Compartment	Not present	Present	Not present	Not present
Humidification	Not present	Not present	Present	Present
PH monitoring	Inbuilt for online for all 06 chambers	Present online for reference chambers (with fibre optic non contact pH measurement	Optional	Not present
Inbuilt PH Meter	Present	Present	Not present / In-built Battery	Not present
Temperature validation	PT1000 Validation Port	No Built in Device	No Built in Device	No Built in Device
Gas Sensor	Present	Not present	Not present	Not present
Heating system	12 PID controllers for Individual heating of Bottom as well as LID for all 6 chambers.	Non elective EM Nutra technology for zero electromagnetic fields	Standard heater	Standard heater
In built data logging facility (stand alone)	Present, external alarm facility	Present	Not present	Not present
Price (Approximate in INR)	13 Lacs	17 Lacs	07 Lacs	07 Lacs
Indian dealer	ESCO India	S tech Associates	Trivector Origio Scientific Pvt. Ltd	InterMedics

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Hosted by:

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ACADEMIC CALENDAR 2015

IVF CONNECT

IFS offers targeted IVF COURSES to its lifemembers

Target Audience: This course is meant for clinicians

- Who wish to upgrade themselves,
- Those who have just started practicing IVF,
- Those who wish to now start doing IVF but have mastered the art of IUI

Courses are scheduled in year 2015 in following cities:
Feburary: Jullundhar

IUI WORKSHOPS

Focused IUI workshops for beginners who wish to enter infertility management and enhance their knowledge and technique.

Target Audience: General gynecologist and other clinicians who wish to enhance their knowledge and practice of infertility.

Courses are scheduled in the following months for the following cities:
January: Moradabad. **Feburary**: Banglore

PCOS WORKSHOP

The PCOS workshops will be held in all major cities of the country to spread the outcome of Consensus on Evidence-based Good Clinical Practice Recommendations. This would further help us in getting more inputs from various parts of the country.

WEBCAST PROGRAMME

WEBCAST I:
Lecture series 1: Evaluation of Female Infertility
Topic 1: Evaluation of female infertility: Ovarian function; Ovarian reserve; HPO axis evaluation
Topic 2: Endometrium /tubal factors

Lecture series 2: Management of Female infertility
Topic 1: Management of female infertility: Ovarian stimulation protocols: Generalized or Individualized?
Topic 2: Artificial reproductive techniques -ART/ IUI; Luteal support; Basic requirements for ART success; Nutritional supplements and ART outcomes

WEBCAST 2:
Lecture series 1: Evaluation of Male infertility
Topic 1: Evaluation of male infertility; Clinical workup
Topic 2: Optimizing sperm assessment; Sperm function Test

Lecture series 2: Management of Male infertility
Topic 1: Management of male infertility; Pharmacological treatments/ ED
Topic 2: Surgical management /Surgical sperm retrieval

WEBCAST 3:
Lecture series 1: Recent advances and future trends in infertility

IFS - WEBINAR

This involves live webcast of lecture covering topics on infertility. The lectures will be relayed from Delhi to satellite centers over 30 cities. Tentative dates- Jan 2015- March 2015. Satellite cities and details of programme can be obtained from website www. indianfertilitysociety.com

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