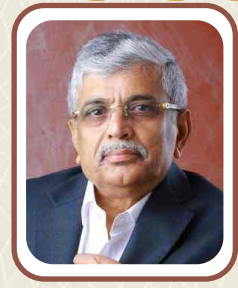




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" YTP UPDATE 2020"

SEX AND FERTILITY

Birds do it and bees do it. . .

The act of sex is the basis of reproduction, hence is required for the propagation of all species on earth and is essential to prevent their extinction. The father of evolution Darwin wrote in 1862, "we do not even in the least know the final cause of sexuality; why new beings should be produced by the union of the two sexual elements. the whole subject is as yet hidden in darkness." With all its consideration, even today talking about sex or acknowledging it publicly is still considered a taboo. It is still considered as a very private issue which is rarely spoken out. It has to be emphasised that sex should be spontaneous and a regular sexual act aids in procreation. A healthy sexual life in a couple not just helps to increase intimacy, but also builds a stronger relationship between them along with other health benefits.



But these days, sexual frequency has come down among couples due to various reasons. Changes in lifestyle and shifting of priorities result in couples these days having sex only as a need to reproduce. Women work equally as men and are career oriented hence the couple decides to postpone pregnancy thereby reducing sexual activity. When they decide to have a child, sex becomes more of a work than play. And when sex is used solely for procreation it becomes mechanical. Couples lose interest in the act, which ultimately will cause performance anxiety leading to sexual dysfunction and decreased frequency of intercourse and all of this will finally lead to infertility.

Love making, which was once a warm loving, intimate and pleasurable experience has now become a dreaded chore to these couples. Nowadays sex has become the battleground in which a couple's fear and anxieties and depressions are let out. These days the couples being well informed and plan to focus their sexual life only during the so-called "fertile window". But most of them are not aware that the fertile window depends on the length of the menstrual cycle which is not the same for all women and often do they miss the real "fertile period" when sex is followed

only on those limited days. All this in addition will only delay the possibilities of a successful natural conception.

Timed sexual intercourse is frequently prescribed treatment in many infertile couples. With new sophisticated methods are available in the market to time coitus, like LH kits more and more couple are depending on the it. But what is little know or accepted is that it only adds financial expense to the already existing stress of timed intercourse. There is complete lack of data to prove that the pregnancy rate increases with the use of such kits.

Evidence shows that the stress with timed intercourse may actually hinder normal reproductive function. Available data also proves most of the period of peak fertility is missed when coitus is timed with the menstrual calendar method, basal body temperature or LH kit. Several studies suggest that while timing intercourse according to the LH surge is inappropriate for IUI and such timing might allow the optimal period for spontaneous conception to pass. There is also a misconception prevailing that, coitus post ovulation could cause abortion, hence, couples avoid sex after the assumed fertile period which most often does not correlate with the real time of ovulation thereby increasing the time to conception.



The recommendation of routine coital frequency for at least twice a week not only alleviates the stress but also ensures coitus during the fertile period thus increasing the chance of pregnancy. This was also concluded in the study by SK Agarwal et al in 1994.

NICE 2017 GUIDELINES STATES :

'People who are concerned about their fertility should be informed that vaginal sexual intercourse every 2 to 3 days optimises the chance of pregnancy.' [2004, amended 2013]

In young couples, when the female partner is normal and the infertility is due to mild male factor, pregnancy is still achieved by just increasing the trying time and frequency of sexual intercourse. When intercourse is planned solely for the purpose of pregnancy, it only adds stress to the couple and they don't experience pleasure which causes gradual decrease in interest to perform the act causing reduced sexual frequency.

With planning, the spontaneity is taken out of sex and what was used to connect the couple intimately and help them escape from their troubles blissfully has now become a painful reminder of the failures within them. Thus, sex will deviate from a process of hope and

connection in their life to a reminder of their failure.

As we all know that a delay in age of marriage due to social changes is a significant contributor of infertility, the couples of this generation are also burdened due to the change in sexual behaviour and sexual dysfunction, decreased frequency of sexual intercourse, changes in sexual behaviour and sexual dysfunction. Nathan Perlis et al (2013), in his study concluded older men and erectile dysfunction are independent risk factors for less frequent among infertile men which ultimately has an impact on fertility. He also stated the importance of coital frequency in infertility assessments.

Regular sexual frequency is the best stimulus for spermatogenesis. Decreased sexual frequency could affect the semen parameters in the long run. F. Lotti et al (Hum Reprod Dec 2016), in his study showed that men with sexual dysfunction have semen quality impairment according to its severity. So maintaining regular frequency of intercourse is crucial for good spermatogenesis and sperm quality.

Long periods of abstinence can also cause increased sperm DNA fragmentation which is also a reason for infertility and miscarriage due to poor embryo development. The percentages of DNA fragmentation and MMP (mitochondrial damage) worsened with the increased duration of abstinence. The percentage of sperm protamination was statistically significantly increased with abstinence (Vanessa et al 2017). Frequent ejaculations decrease the time the sperms are stored in the epididymis and their exposure to ROS thereby decreases the DNA damage.

Correlation between sperm DNA fragmentation, sperm chromatin packing, sperm apoptosis and sperm mitochondrial membrane potential according to the sexual abstinence period.								
Semen Parameters	Regression analysis			Sexual Abstinence Period Groups				
	Spearman's rank correlation	95% Confidence Interval	p	Total n:2458	<2 days n:244	2-5 days n:1932	>5 days n:282	p
DNA fragmentation (%)	r: 0.12	0.16 to 0.44	<0.0001	15.4±8.5	14.5±8.2 ^a	15.3±8.4 ^b	17.1±9.0 ^{a,b}	^a 0.001 ^b 0.002
Abnormal MMP (%)	r: 0.10	0.03 to 0.16	0.003	25.7±16.4	23.3±14.0 ^a	25.6±16.5	28.6±17.5 ^a	^a 0.01
CMA ₃ positivity (%)	r: -0.12	-0.14 to -0.04	<0.0001	56.1±15.2	59.8±15.3 ^{a,b}	56.1±15.2 ^{a,c}	53.2±14.2 ^{a,c}	^a 0.005 ^b 0.0002 ^c 0.02
Apoptosis (%)	r: 0.01	-0.03 to 0.06	0.21	19.2 ±7.9	19.3±8.5	19.1±7.9	20.2±7.3	0.17

Values within rows with the same superscript letter were significantly different.

A Systematic review (Hansen et al) evaluating the impact of ejaculatory abstinence on semen parameters and reproductive outcome demonstrated that longer abstinence is associated with increases in semen volume and sperm count whereas motility, morphology, and DNA fragmentation rates showed improvement with shorter abstinence. Some studies evaluating the impact of ejaculatory abstinence on intrauterine insemination (IUI), intracytoplasmic sperm injection (ICSI), and in vitro fertilization (IVF) demonstrated an association between short abstinence and improved outcomes. This high turnover of spermatozoa might protect them from senescence or long-term exposure to ROS generated by leukocyte and other toxic substances in the male reproductive tract.

Summary of key results based on parameter

Morphology	16	<ul style="list-style-type: none"> • Kruger's strict criteria for morphology utilized by 1 publication • WHO morphology guidelines utilized by 15 publications • 11 out of 16 publications (68.8%): no differences in morphology were noted based on varying abstinence times • 5 out of 16 publications (31.2%): an association was noted between abstinence time and morphology. Peak morphology ranged from 30 to 40 min to 3–8 days of abstinence. Significant variation was noted between studies
Semen pH	3	<ul style="list-style-type: none"> • 3 out of 3 publications (100%): semen pH did not vary based on varying abstinence
DNA fragmentation rate	8	<ul style="list-style-type: none"> • 5 publications utilized flow cytometry. 3 publications utilized sperm chromatin dispersion testing • 4 out of 8 publications (50%): no differences in DNA fragmentation rate were noted based on varying abstinence times. All 4 of these publications utilized flow cytometry • 4 out of 8 publications (50%): abstinence of < 24 h was associated with the lowest rates of DNA fragmentation. The 3 publications utilizing sperm chromatin dispersion testing were in this group
Viability	5	<ul style="list-style-type: none"> • 4 out of 5 publications (80%): no differences in rates of viability were noted based on varying abstinence • 1 out of 5 publications (20%): the total number of viable sperm increases with abstinence of 6–7 days compared to shorter abstinence
Pregnancy outcomes (with ART)	3	<ul style="list-style-type: none"> • 1 study evaluating pregnancy rates with IUI after varying abstinence: the highest pregnancy rates were seen following < 3 days of abstinence • 1 study evaluating pregnancy rates with ICSI after varying abstinence: the highest pregnancy rates were seen following 24 h of abstinence • 1 study evaluating fertilization rates with IVF after varying abstinence: the highest fertilization rates were seen following 30–60 min of abstinence

There is no proven cut off for any semen parameter which could accurately yield a successful pregnancy, hence increase in sexual frequency will lead to maximum exposure of sperms around the time of ovulation. Especially in patients with Polycystic ovarian syndrome who have oligo ovulation and hence irregular or delayed ovulation, regular sexual frequency will help. As people with irregular menstrual cycles are especially the ones who may have delayed ovulation and timed intercourse reduces the chance of conception as ovulation may not be accurately timed.

Semen parameters and quality are better with intercourse than with masturbation and thus, natural intercourse is superior. *NV Sofikitis et al*,[□] (J Andro Sep-Oct 1993) did a study on endocrinological, biophysical and biochemical parameters of semen collected via masturbation versus sexual intercourse. It was confirmed that volume of seminal plasma, total sperm count, sperm motility and percentage of morphologically normal spermatozoa were significantly higher in samples collected at intercourse than masturbation. Masturbation that is done under artificial environments and is not as pleasurable as natural intercourse may have possibly lead to the decreased quality of sperms.

Thus, natural intercourse should not be substituted with IUI. Not only the semen quality is affected, but the prepared semen for IUI undergoes centrifugation which causes more ROS exposure. Once capacitation is started in the prepared semen, sperm doesn't survive long in the genital tract compared to the semen ejaculated during intercourse where the sperms could survive for more than 72 hours in the cervical crypts. It is also said that the seminal plasma and its prostaglandin content helps to improve the endometrial receptivity and implantation, but this gets removed during the process of semen preparation for IUI.

IUI should be done only for definitive indications such as donor insemination, unexplained infertility, cervical factors such as decreased cervical secretion, mucus hostility, anti-sperm antibody which hinders sperm migration, sexual dysfunction - erectile/ejaculatory dysfunction/vaginismus, ovulatory dysfunction as in severe/resistant PCOD where ovulation is achieved with great difficulty. In other patients who are undergoing IUI, any extra benefit is doubtful.

The belief that sexual intercourse should not be done before or after IUI is performed is again a myth. As long as the patient does not have collection problems the couple can continue to have sex till the IUI as it only decreases the ROS

damage in the ejaculated sperm. An ejaculatory abstinence period of ≤ 2 days before IUI produced the highest pregnancy rate per cycle, compared with a longer period of ejaculatory abstinence. This higher conception rate occurred despite a lower total number of motile spermatozoa inseminated. (Marshburn et al, Fert ster 2010).

Pregnancy Rate per IUI Cycle in Relation to the Period of Ejaculatory Abstinence					
Group	EA (days)	Pregnancy Rate (%)	P- Values		
			A	B	C
1	≤ 2	11.27	<0.02	<0.05	0.72
2	3-5	6.07			
3	>5	7.25			

A = Group 1 vs. Group 2; B = Group 1 vs. Group 2 + 3; C = Group 2 vs. Group 3

Marshburn. Correspondence. Fert Steril 2010.

Sexual intercourse should also be advised even after IUI as it only increases the likelihood of pregnancy by providing the female genital tracts with other constituents of the seminal plasma which gets washed away during semen processing. Seminal plasma (SP) is the liquid fraction of semen produced by the male accessory sex organs. In addition to serving as a vehicle to transport sperm, SP can also elicit responses in the female reproductive tract (FRT) that promote conception, in particular implantation, confirmed in a recent meta-analysis (Crawford et al., 2015)

So today, it's important to educate the couples regarding the significance of regular and spontaneous sex in their life and its benefits on their life together as a couple, with procreation only as one of the important end product of the process. When sex becomes only for procreation, you take away the pleasure associated with it and further make it repulsive. This will reduce the sexual frequency and can cause performance anxiety, all of which can lead to deterioration of the sperm parameters. The concept of timed intercourse should be dealt away with, unless in specific situation when it is warranted medically. The misuse/overuse of IUI also needs to be curtailed and focussed on the right group of patients at the right time.

REFERENCES

1. SK Agarwal, Does recommending timed intercourse really help the infertile couple? *Obstet Gynecol* 1994 Aug;84(2):307-10.
2. NICE Guideline September 2017 (1.2.21.2.2 Frequency and timing of sexual intercourse or artificial insemination)
3. Nathan Perlis, Coital frequency and infertility: which male factors predict less frequent coitus among infertile couples? *Fertil Steril* 2013 Aug;100(2):511-5.
4. F. Lotti, G et al, Semen quality impairment is associated with sexual dysfunction according to its severity, *Human Reproduction*, Volume 31, Issue 12, 1 December 2016, Pages 2668–2680
5. Vanessa et al, Influence of the abstinence period on human sperm quality: analysis of 2,458 semen samples, *JBRA Assist Reprod.* 2017 Dec 1;21(4):306-312
6. Hansen et al The impact of ejaculatory abstinence on semen analysis parameters: a systematic review *J Assist Reprod Genet* 2018 Feb;35(2):213-220.
7. Nikololas et al, Endocrinological, Biophysical, and Biochemical Parameters of Semen Collected via Masturbation versus Sexual Intercourse, *Journal of Andrology* Volume14, Issue5 September-October 1993 Pages 366-373
8. Marshburn et al, A short period of ejaculatory abstinence before intrauterine insemination is associated with higher pregnancy rates, *Fertil Steril* 2010;93:286–8
9. G Crawford et al, The role of seminal plasma for improved outcomes during in vitro fertilization treatment: review of the literature and meta-analysis, *Hum Reprod Update*, Mar-Apr 2015;21(2):275-84