# Presence of Sperm in Pre-Ejaculatory Fluid of Healthy Males

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***Background:*** *Coitus interruptus, a common contraceptive method, has a high failure rate. Two reasons have been proposed for this: delayed withdrawal after ejaculation and presence of sperm in the pre-ejaculatory fluid.*
***Objective:*** *To determine whether sperm was present in the pre-ejaculatory fluid of healthy males.*
***Material and Method:*** *A total of 42 healthy Thai men were enrolled in the study between August 1, 2009 and November 30, 2009 at the Department of Obstetrics and Gynecology, Rajavithi Hospital. They were asked to collect pre-ejaculatory fluid smears in two glass slides and then deposit a semen sample in a plastic bottle after masturbation. Microscopic examination of wet and air-dried preparations and routine semen analyses were done consecutively in the human genetics laboratory.*
***Results:*** *Actively mobile sperm were found in 16.7% (7/42 cases) of the pre-ejaculatory penile secretions of subjects whose sperm counts were 2 in 2 cases, 3 in 3 cases and 4 per high power field in the other 2 cases of positive sperm. Semen analyses were normal in 41/42 volunteers (97.6%); there was one case of oligospermia ($14x10^6$/ml).*
***Conclusion:*** *Actively mobile sperm were discovered in the pre-ejaculatory fluid of 16.7% of healthy men.*

***Keywords:*** *Coitus interruptus, Sperm, Pre-ejaculatory fluid, Thai male*

***J Med Assoc Thai 2016; 99 (Suppl. 2): S38-S41***
***Full text. e-Journal:*** *http://www.jmatonline.com*

Coitus interruptus (CI), or withdrawal of the penis before ejaculation, has been reported as a common contraceptive method in many countries, its use varying from 5-70%[1-6]. Some people believe that it is reliable, healthier, easier or more convenient than other contraceptive methods[7]. Kovavisarach and Saringcarnan[6] reported that 70% of the female patients seeking services at Department of Obstetrics and Gynecology in Rajavithi Hospital used CI as their choice of contraception in 2005; however, CI had a high failure rate of between 7% and 37% in 100 woman-years of using CI as a contraceptive method[6]. Two reasons were proposed for this failure rate: delayed withdrawal after ejaculation and/or the presence of sperm in the pre-ejaculatory fluid (PF)[1]. PF was defined as clear mucoid fluid secreted by the Cowper's gland (bulbourethral gland) during sexual arousal and in the plateau phase before ejaculation[8]. Sigman and Jarow[9] observed that before ejaculation, a small amount of fluid (about 0.1 ml) from the gland of Littre (periurethral gland) and Cowper's gland is secreted followed by a low-viscosity opalescent fluid from the prostate containing a few sperm. It is unnecessary, and quite difficult, to differentiate between the two fluids. Recently, eleven studies[8,10-19] reported contradictory results regarding the presence of sperm in PF in small sample sizes. The present study was conducted to determine the presence of sperm in PF of healthy Thai men on a larger scale.

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## Material and Method

The protocol of this research was reviewed and approved by the ethics committee of Rajavithi Hospital (No. 29/2552).

This descriptive prospective research was carried out on healthy Thai male volunteers between August 1, 2009 and November 30, 2009 at the Department of Obstetrics and Gynecology, Rajavithi Hospital. The inclusion criteria were Thai men aged 18-45 years old who had no ejaculation for at least 3 days before examination. The exclusion criteria: were ejaculatory problems such as premature ejaculation;

obstructed urethra; previous male sterilization; history of infertility; and history of chronic prostatitis or other medical diseases such as diabetes mellitus and hypertension.

Informed consent was obtained before the subjects participated in the study. The volunteers were asked to collect their specimens through masturbation in 2 stages: the first sample, clear mucoid fluid, was collected as a smear on two glass slide of the fluid first emitted from the urethral meatus during the sexual arousal and plateau phase of the sexual response cycle; the second sample, ejaculatory fluid, was collected in a plastic bottle during the orgasmic phase of the sexual response cycle. Not more than 1 hour after ejaculation, microscopic examinations of the wet preparations were performed to detect active sperm, after which these slides were left to air-dry and the smears were then examined by the third author (Muangsamran P). A second microscopic examination was performed to demonstrate fern-like pattern and routine semen analyses were done later in the human genetics laboratory by the third author (Muangsamran P). The time interval from semen sample to semen analysis was not more than one hour. True PF was confirmed when the fern-like pattern, resembling the wet preparation of cervical mucus from females before ovulation, appeared in the second microscopic examination.

## Results

Forty-two men were enrolled in the study. Their mean age was 27.5 years, 38 percent (16/42 cases) were married, and 43.8% (7/16 cases) of them had at least one child. Their occupations were: medical personnel 42.9% (18/42 cases); hospital workers 35.7% (15/42 cases); and security guards 21.4% (9/42 cases). All collected specimens were checked for true PF. Semen analysis in most cases (97.6%: 41/42 cases) appeared normal except in one case of oligospermia ($14x10^6$/ml). Mean sperm count and motility were $49.2x10^6$/ml and 74.8%, respectively. Only 7 of 42 cases (16.7%) had sperm in the pre-ejaculatory penile secretion. Actively mobile sperm were identified in all of these positive subjects: 2 cases had average sperm of 2 per high power field (HPF), 3 cases had an average of 3 sperms per HPF, and 2 cases had an average of 4 sperms per HPF.

## Discussion

In 2011, after the present research had been concluded, Killick et al[20] reported an additional study which found positive sperm in PF. Papers about the presence of sperm in PF could be divided into two groups: those which found sperm in PF (positive sperm in PF)[10,12-16,20] and those which did not (negative sperm in PF)[8,11,17-19]. Among the positive sperm in PF group, three studies[12,13,20] had documented data while the other four[10,14-16] did not. Three papers[8,11,17] in the negative sperm in PF group had documented data while the other two[18,19] did not. To the best of our knowledge, the present paper had the largest number of participants (42 cases) of any study of the presence of sperm in PF; the number of participants in the other studies varied from just 10 to 27 cases[8,11-13,17,20]. Low sample size should be considered as one of the causes of absence of sperm in PF in the three documented papers[8,11,17] of negative sperm in PF.

Only healthy men were enrolled in the present study while some people in the studies of both Ilaria et al[11] and Pudney et al[12] were HIV-1-seropositive, and some people in Zukerman et al's[8] study had some sexual problems such as premature ejaculation and excessive fluid secretion during foreplay. It is interesting that sperm could be identified as a few small clumps in the PF of HIV-1-seropositive cases while it could not in those of HIV-1-seronegative cases in Pudney et al's study[12], while Ilaria et al[11] reported absence of sperm in PF of both HIV-1-seropositive and seronegative cases; however, HIV-1-serology was not tested in the present study, and there was only one physically healthy man whose sperm count ($14x10^6$/ml) was a little below the World Health Organization (WHO)'s newest criteria for diagnosis of oligospermia ($15x10^6$/ml)[21].

All studies except Zukerman et al's[8] and the present one failed to specify how they defined true PF[11,13,17]. Smearing ejaculatory fluid instead of PF was thought to be one of the causes of the high presence of sperm in PF (66.7%) in Pudney et al's study[12]. Killick et al[20] also reported a high percentage of sperm in PF (11/27; 41%) and most of them (10/27; 37%) contained active sperm. However, they did not mention about confirmation of PF. They suggested that PF tended to be more cellular. Sperm concentration and mobility were identical in PF and ejaculatory fluid in only 7.5% (3/40). Even though Stone and Himes[13] had similar results (20.8%) to the present study (16.7%), they reported that forty percent (2/5 cases) of the positive cases had a large number of sperm in their specimens while the highest sperm count in the present study was 4/high power field (in just two positive cases). The possibility of contamination of the sperm in ejaculatory fluid should be considered in those studies[12,13].

Even though the same confirmation technique was used in this research as in that of Zukerman et al's[8], one difference was that the authors of the present report used wet preparations to identify the actively mobile sperms and then air-dried preparations to demonstrate the fern-like pattern for proof of true PF in the present study. The other difference in practice between these two studies was that in Zukerman et al's study[8], the specimens were collected on three slides from at least two different occasions of sexual activity, while in the present study only two slides were obtained from each volunteer on a single occasion and semen samples were collected in the same episode. In Zukerman et al's study[8] semen samples were collected after a 3-day abstinence, and not in the same episode. The authors believe it should not matter whether both smears and semen analysis are collected on the same day, and we also believe that the number of slides used should not make any difference to the result, so we chose our method because it was more convenient for subjects to provide semen samples on the same day as smearing for PF.

It is very difficult to conclude whether actively mobile, but very low numbers of 2-4 sperms/high power field, are responsible for the failure rate of CI as a contraceptive method even when the penis is withdrawn in a timely fashion before ejaculation.

Further investigations to confirm the existence of sperm in PF in larger populations, wider age groups and a variety of ethnicities are suggested for the future.

**Conclusion**

Actively mobile sperm were found in pre-ejaculatory penile secretion of 16.7% of healthy men.

**What is already known on this topic ?**

Eleven studies previously reported contradictory results about the presence of sperm in PF. Six papers revealed positive sperm in PF while five papers reported negative results. These entire studies enrolled small sample sizes (just 10-24 cases), some cases had sexual problems and some subjects were HIV–seropositive.

**What this study adds ?**

This study showed that actively mobile sperm could be identified in the PF of Thai males. The large and healthy population in this study was the major way in which it differed from the other studies. Prevalence of positive sperm in PF was quite low (16.7 percent).

**Acknowledgement**

The authors wish to thank Assistant Professor Dr. Kasem Sereeporncharoenkul, Head of the Department of Obstetrics and Gynecology, Rajavithi Hospital, for permission to conduct and publish this research, and Rajavithi Hospital for the research grant, which partially supported the study.

**Potential conflicts of interest**

None.

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## *การมีอยู่ของตัวอสุจิในน้ำคัดหลั่งในผู้ชายที่มีสุขภาพแข็งแรง*

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***ภูมิหลัง:*** *การหลั่งภายนอกเป็นการคุมกำเนิดที่ใช้กันทั่วไป แต่มีโอกาสล้มเหลวได้แตกต่างกัน สาเหตุที่เป็นไปได้คือการถอนองคชาตออกช้า และการมีตัวอสุจิในน้ำคัดหลั่งก่อนหลั่งน้ำกาม*

***วัตถุประสงค์:*** *เพื่อตรวจดูการมีอยู่ตัวอสุจิในของน้ำคัดหลั่งก่อนหลั่งน้ำกามในผู้ชายที่มีสุขภาพแข็งแรง*

***วัสดุและวิธีการ:*** *ผู้ชายไทยที่มีสุขภาพแข็งแรงอายุระหว่าง 18-45 ปี ที่สมัครเข้ามาที่กลุ่มงานสูตินรีเวชศาสตร์ โรงพยาบาลราชวิถี ระหว่างวันที่ 1 สิงหาคม พ.ศ. 2552 ถึง 30 พฤศจิกายน พ.ศ. 2552 จำนวน 42 คน โดยให้อาสาสมัครทำการสำเร็จความใคร่ด้วยตนเองโดยใช้มือและเก็บน้ำคัดหลั่งก่อนหลั่งน้ำกามป้ายใส่แผ่นสไลด์ จากนั้นให้เก็บน้ำอสุจิแล้วจึงนำน้ำคัดหลั่งก่อนหลั่งน้ำกาม ส่งตรวจหาตัวอสุจิและนำน้ำอสุจิเพื่อไปตรวจคุณภาพของน้ำอสุจิที่ห้องปฏิบัติการมนุษยพันธุศาสตร์ โรงพยาบาลราชวิถี*

***ผลการศึกษา:*** *พบตัวอสุจิในน้ำคัดหลั่งก่อนหลั่งน้ำกามของชายไทยที่มีสุขภาพแข็งแรงได้ร้อยละ 16.7 (7 ใน 42 ราย) โดยรายที่พบตัวอสุจินี้พบได้ 2 ตัวต่อ high power field ใน 2 ราย, 3 ตัวต่อ high power field ใน 3 ราย และ 4 ตัวต่อ high power field ใน 2 รายตามลำดับอาสาสมัครเกือบทุกคนมีการตรวจอสุจิ (semen analysis) ปกติ (41 ใน 42 ราย) โดยหนึ่งรายมีตัวอสุจิน้อยกว่าปกติ ($14x10^6$/มล.)*

***สรุป:*** *อัตราการพบตัวอสุจิในน้ำคัดหลั่งก่อนหลั่งน้ำกามของอาสาสมัครชายที่มีสุขภาพดีเท่ากับร้อยละ 16.7*