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RESEARCH ARTICLE

Male Infertility: An Epidemiological and Clinical Profile at the Andrology Unit of Dr. Soetomo Hospital, Surabaya, Indonesia

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Abstract

Objective: To discover and to lay out epidemiological features and clinical characteristics of patients with infertility problems who seek treatment at the Andrology Unit of Dr. Soetomo Hospital. Methods: A cross sectional study was conducted to men with infertility who sought treatment in the Andrology Unit of Dr. Soetomo Hospital ranging from January to December 2017. Only patients who lived together with their spouses were included as research subjects. Results: The average age of the patients was 33.76 years (age ranged from 25 to 46 years) and the average age of their spouses was 30.4 years (age ranged from 19 to 42 years). The average duration of infertility is 4.25 years (between 1 year and 13 years). Average age of puberty was 14.5 years old. First consultations were late with average of 4.46 years. From overall infertile patients, 90% of them were categorized as primary infertility. History of smoking was found in 84 people (68.29%), history of wearing tight pants 27 people (21.95%). In terms of Body Mass Index(BMI), we found that underweighted patients comprise 7% (9 patients) from total liable subjects, while 55 people (55%) were in the area of ideal body mass, 46 people were overweight (35%), whereas obesity was found in 13 subjects (10%). The results of semen analysis showed that the most case were asthenoteratozoospermia 34 people (27.6%). A careful history, physical examination and semen analysis can determine the cause of male infertility. The cause of male infertility in Surabaya, Indonesia is very complex, which involves older age, delayed consultation and background as risk factors that cause abnormalities in semen analysis.

Keywords: *Male infertility, epidemiology, andrology, Dr. Soetomo Hospital, Surabaya, Indonesia.*

Introduction

Infertility is defined as the inability to have offspring within one year with regular intercourse (2-3 times a week), without any contraception.[1] Male infertility comprises almost half of the total infertility cases.[2] Despite many advances in medical science and technology, especially in infertility management, the number of infertility cases is still unceasingly increasing.[3,4] Meanwhile, only a few researches on male infertility were conducted in Indonesia, particularly epidemiological study. The aim of this study was to describe the epidemiological side of infertility cases in Indonesia, which consist etiological and clinical profile of male infertility, especially in Surabaya.

Patients and Methods

A descriptive, cross-sectional design was implemented in this one year study, starting from 1st January to 31st December 2017.

Samples of this study were taken from the patients' medical records in Andrology Unit of Dr. Soetomo Hospital, Surabaya, Indonesia. Men who were diagnosed as infertile by the attending andrology specialists were included in the study. Semen analysis is a must in this study, for at least 2 times with 3 months interval. Semen was collected in glass container by masturbation, with the prior abstinence period of 2 to 7 days. Semen analysis was performed according to the WHO guidelines. In several patients, additional hormonal examinations consist of FSH and testosterone level were done.

Results

During the study period, 172 patients visited the Andrology Unit of Dr. Soetomo Hospital, Surabaya, Indonesia, and 123 of them were eligible to the study according to the inclusion criteria (71.5%). The average age of men was 33.76 years with the youngest was 25 years old and the oldest 46 years old. The highest percentage of patients were in the 30 -40 years old age group (Table 1).

Table 1: Distribution of patient according age group

Age group (year)	Number of Patients	Percentage (%)
20 - 29	34	27.64
30 - 40	60	48.78
40 - 50	17	13.28

The average age of the spouses was 30.4 years with the youngest was 20 years old and the oldest was 42 years old. The majority of the patients were employee in government or private office (40%), while other occupation consist of farmer and trader, respectively 30% and 15%, and the other 15% were unspecified. Eighty percent of patients reside in urban areas. More than a third of the patients were referred by other doctor, in which 25% of them were referred by gynecologist, and the other 12% by general practitioner, whereas 63% of cases were without any reference. The average consultation delay was 4.46 years (ranged from 1 year to 8 years) (Table 2).

Table 2: Distribution of patients according to first consultation delay

Delay of First Consultation (years)	Number of Patients	Percentage (%)
1 – 2	84	68.29
3 – 4	27	21.95
5 – 6	84	68.29
7 – 8	27	21.95

The average duration of infertility was 4.25 years, ranged from 1 year and 13 years. Primary infertility was the majority of the case, consisting 90% of the total cases, while the other 10% were secondary. The average age of puberty was 14.5 years old, ranged from 12 to 20 years old. The average frequency of sexual intercourse was 2 to 3 times per week in 95 cases (78%). In terms of medical history, sexual transmitted diseases were found in 2 cases (1.6%). History of smoking was found in 84 cases (68.29%) and wearing tight pants was in 27 cases (21.95%). In addition, from general examination, obesity with body mass index (BMI) more than 30% was observed in 13 cases (8.13 %). Furthermore, from andrological examination, varicocele was observed in 28 cases (22.76%). (Table 3).

Table 3: Distribution of patients according background

Background	Number	Percentage (%)
Sexual transmitted diseases	2	1.19
Smoking	84	50.0
Wearing tight pants	27	16.07
Obesity	13	7.73
Varicocele	28	16.67
Small testicle volume	12	7.14
Undescended Testis	2	1.19

Semen analysis was performed in all patients. The three most frequent results of semen analysis were asthenoteratozoospermia in 34 cases (34.3%), followed by teratozoospermia in 30 cases (24.3%) and oligoasthenoteratozoospermia in 21 cases (17.0%). In the sperm concentration parameter, the oligozoozpermia was very dominant, and followed by severe oligozoospermia and non-obstructive azoospermia. The complete semen analysis profile was showed in Table 4. In azoospermia cases (11 cases), additional hormonal analysis was performed. Elevated FSH levels were observed in five cases, while low testosterone levels were observed in three cases.

Table 4: Seminal analysis result

Semen analysis result	Number	Percentage (%)
Normozoospermia	4	3.2
Oligozoopermia	1	0.8
Asthenozoospermia	2	1.6
Teratozoospermia	30	24.3
Oligo-astheno-zoospermia	1	0.8
Oligo-terato-zoospermia	4	3.2
Astheno-terazoospermia	34	27.6
Oligo-astheno-teratozoospermia	21	17.0
Severe oligo-asthenozoospermia	10	8.1
Azoospermia	14	11.8
Aspermia	1	0.8
Retrograde ejaculation	1	0.8

Discussions

Actually, other than andrology, there are several other specialties that involved in the management of infertility, namely obstetrics gynecology and urology. Obstetrics gynecology is the leading specialist in the management of infertility, because most of the infertile couples came to them to have consultations in the first chance.

This condition is related to the belief of the society that infertility is only caused by female factors. Some other patients was referred to urology specialist for sperm abnormalities related diseases such as varicocele, undescended testis, ejaculatory duct obstruction and sperm retrieval for in vitro fertilization (IVF) – intracytoplasmic sperm injection (ICSI). Meanwhile, andrology was still unbeknownst to infertile patients, even to some doctors.

In contrast, in our clinic, if compared to other infertility centers, the number of male infertility patients were quite high. These patients comprised 50% of the total patients who visited the Andrology Unit. Most of the patients were not referred, but rather they came on their own volition. This is understandable because our andrology unit also served as an infertility centers in academic hospital in Surabaya, Indonesia.

Age is also considered as a regulating factor in couples of infertility. In women, the increase in age will be inversely affecting the quality of the egg. And, in line with that, the increase in age also decrease male fertility. Researches in seminal analysis showed there were several kind of damages that were inflicted by age.[5] This phenomenon was related to genetic material alterations of the sperm with age.[6] Nocturnal emission was considered as an accurate marker of male coming of age, which is the start of further development of the male reproductive system.

The age of first nocturnal emission, or commonly known as the onset of puberty is very closely related to adulthood semen quality. Late onset of puberty may resulting poor quality of semen in adulthood, which due to the differences in reproductive hormones level. In delayed puberty, testosterone peak level will unlikely be reached, or may be reached later than usual. Sometimes, even the normal level of testosterone might not reached, which ultimately disrupt sperm production in adulthood [7].

The harmful effects of smoking on male fertility have long been known. A few studies mentioned some mechanisms by which lead to infertility, such as the decrease in the quality of semen, dysfunction of the reproductive hormone, disruption of spermatogenesis, sperm maturation and sperm function.[8, 9, 10] The use of tight pants will generate excessive heat, in which induced heat stress that could be interfering with the spermatogenesis process. Heat stress is associated with decreased sperm motility, concentration and viability of sperm in humans [11]. Oxidative stress is believed to be the responsible mechanism in this case[12].

Varicocele was the most frequent physical examination finding in this study. The underlying mechanism of varicocele as a cause to male infertility is due to the increase of temperature in the dilated blood vessels, reflux of toxic metabolite and hypoxia of the testis caused by the stasis of blood vessels [13]. These mechanisms may contribute negatively to the sperm concentration, motility and morphology. Furthermore, aside of those parameters, varicocele may also interfere with sperm DNA fragmentation as well [13].

Obesity is associated with several medical conditions including fertility [14]. According to the guidelines provided by WHO, obesity is defined as body mass index (BMI) above 30 kg / m^2 [15]. Male fertility is influenced by obesity through the reduction of testosterone level which resulted in the interference to the sperm quality [14]. However, another review article which recently published, showed that there is no significant effect between BMI and sperm quality [16].Semen analysis is a routine examination to evaluate male fertility [17]. WHO had published a guideline for semen analysis, including the criteria for normal semen parameters [18]. Sperm abnormalities may cause inability to fertilize oocytes. The two most frequent semen analysis results in this study, were asthenoteratozoospermia and teratozoospemia, which in observation through electron microscopic may show immature sperm shape, morphological apoptotic patterns of sperm and cytoplasm with many sperm fragments. Oligozoospermia, severe oligozoospermia and non-obstructive azoospermia may be related to the small testicle volume.

Azoospermia were categorized into two, namely obstructive and non-obstructive azoospermia. There was no obstructive azoospermia reported in this study. This phenomenon was supported by the low prevalence of infection history. Meanwhile, the high prevalence of non-obstructive azoospermia was associated with elevated FSH levels. It means that the damage primarily occurred in the testis. If vitro fertilization (IVF) – intracytoplasmic sperm injection (ICSI) was chosen as the further management of this type of infertility, testicular biopsy should be done prior the sperm retrieval. In addition, we also reported one case of retrograde ejaculation and one case of aspermia.

Conclusion

A careful history, physical examination and semen analysis can determine the cause of male infertility. The cause of male infertility in Surabaya, Indonesia is very complex, which involves older age, delayed consultation and background as risk factors that cause abnormalities in semen analysis.

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