

Cost burden of male infertility investigations and treatments: A survey study

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Abstract

Purpose: Male infertility represents 50% of all infertility problems. The management of male infertility is expensive, causing a huge burden on the patients. In this study, we aimed to calculate the cost burden of male infertility investigations and treatments.

Methods: A total of 600 infertile male patients from a single center in Kuwait city were asked to fulfill an internet-based survey. The survey encompassed data about the cost of different investigations and treatments of male infertility. Patients were also asked about the preference of covering their condition either through government or by private insurance.

Results: A total of 145 patients responded to the survey. Most of the patients earned 3295 United States Dollar (USD) to 6590 USD per month. The cost of the outpatient visit ranged from 131.7 to 263.4 USD. The cost of each hormonal test was 164.5 USD while the average cost of each imaging study was 131.8–164.7 USD. Most of the patients (62.8%) received medical therapy with an expense of >988.74 USD. Varicocele surgery cost ranged from 3295 to 6590 USD while the cost of testicular sperm extraction ranged from 1644 to 3294 USD. Most patients (96.3%) did not have health insurance coverage of infertility. On average, patients spent around 18% of their annual income on infertility care, excluding major surgeries.

Conclusion: Male infertility is a worrisome medical condition that causes a huge burden on the Kuwait community. Effective management necessitates insurance coverage and public health support owing to the huge financial burden on the patients and their partners. Thus, policymakers should re-evaluate their protocols of spending on male infertility care.

Keywords: Cost, insurance, Kuwait, male infertility

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INTRODUCTION

Male infertility is defined as a lack of ability to cause pregnancy in a fertile female after 12 months of regular unprotected intercourse.^[1] It represents a fundamental public health concern since it resembles approximately 50% of human infertility.^[2] Although the condition is

multifactorial, semen deficiencies is a common cause of male infertility.^[3] There is no established worldwide statistics regarding the exact number of affected individuals. In addition, male infertility is usually underreported since male partners ignore to receive any laboratory screening procedures of infertility or any sexual health care.^[4]

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In the United States, the finding from the National Survey of Family Growth illustrated that 18%–27% of men who seek infertility management do not fill up all evaluation procedures.^[5] On another hand, a recent study has revealed that household income is a common barrier in the management process of male infertility.^[6] The cost of male infertility investigations and treatment is very large and it represents a significant obstacle, even among couples with high income.^[6] In addition, the World Health Organization and American Society of Reproductive Medicine (ASRM) reported that private companies infrequently offer insurance coverage for infertility treatments.^[7] Thus, enhancing access to, and employment of, male reproductive health approaches may improve the outcomes of this health issue.

Furthermore, there is a lack of research regarding the cost burden of male infertility investigations and treatments among Kuwait patients as well as the whole middle-east. To the best of our knowledge, this the first study to evaluate and analyze the different costs of male infertility investigations and interventions in Kuwait. We hypothesize that this study will provide a better understanding and present as an essential reference for the health-care policymakers in future measures.

METHODS

Study setting

This study is a cross-sectional study that has been carried out in Kuwait city among male patients suffering from infertility in order to assess the cost of male infertility management and investigations. A detailed survey including 25 questions, in the Arabic language and in a multiple-choice manner, was distributed among 600 male infertile patients who attended a single urology clinic in Kuwait. A total of 145 patients answered the questionnaire (24% response rate). The study has followed all ethical standard including the declaration of Helsinki and ethical approval. This paper has also adhered to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines of cross-sectional studies.

Questionnaire

The questions included the costs of different investigations and treatments of male infertility. Patients' age, nationality, and income were recorded. The cost and number of different tests including semen, hormonal, and chromosomal tests were recorded. The hormonal tests included testosterone, luteinizing hormone (LH) and follicle-stimulating hormone (FSH), prolactin, and estradiol. Chromosomal tests included karyotype and Y

chromosome microdeletion test were performed in some patients. Ultrasound examination of the scrotum to assess varicoceles and testicular volume and other pathologies were routinely carried out. The cost of medications utilized was recorded. The medications used included a group of hormones such as human chorionic gonadotropin, FSH or hormone modulators such as clomiphene, tamoxifen, anastrozole, and letrozole. Patients who had surgical operations including varicocelectomy and or testicular sperm extraction (TESE) were evaluated as well as patients who had assisted reproductive techniques (ART). The cost and number of ART including intrauterine insemination (IUI) as well as intracytoplasmic sperm injection (ICSI) were estimated. Some of the patients traveled for treatment of male infertility; thus, the cost of overseas treatment was also evaluated. Patients were enquired about insurance coverage for their treatment cost. Eventually, patients' perspectives regarding approving insurance coverage for male infertility treatment were collected. The currency in Kuwait was Kuwaiti dinar which is equivalent to 3.288 United States Dollar (USD) at the time of research. To minimize confusion, we have put all cost figures in USD. Simple descriptive statistics of total percentages and numbers was carried out using Microsoft Excel.

RESULTS

A total of 145 patients responded to the survey. The included participants aged 18–64 years, with the majority at a range of 25–34 years (52.11%). Kuwaiti citizens comprised 88.57% of included patients and the remaining 11.43% were not Kuwait citizens. Regarding infertility duration, 28.8% of patients were infertile since 5–10 years. In terms of monthly income, the majority of patients earned 3,295 USD to 6590 USD. Of note, the infertility of 88.7% of patients was attributed to male factors only. Around 38.7% of patients had 0–5 outpatient visits with specialists for infertility from 0 to 5. The cost of the visit ranged in the majority of cases from 131.7 to 263.4 USD.

Semen analyses were performed between 5 and 10 times in 35% of the cases. The semen test average cost ranged from 23 to 32 USD. Hormonal tests, including testosterone, FSH, LH, Prolactin, Estradiol, were conducted in 51% of the patients, between 1 and 3 times. The cost of each test was 164.5 USD. Chromosomal analyses including karyotype and Y-Chromosome microdeletion test were carried out in 33.7% of the cases. The cost of the test was approximately 658 USD. Imaging studies for infertility including scrotal ultrasound were performed more than once in 50% of the cases; the average cost of each study was 131.8–164.7 USD. Most of the patients (62.8%)

received medical therapy with an expense of more than 988.74 USD. Varicocelectomy was performed in 43.75% of the cases in private hospitals. Out of them, 33.3% of the operation cost was approximately 3,295 USD while in 30.7% of the cases, the cost ranged from 3295 to 6590 USD. When reviewing the azoospermia cases, 11.97% had TESE once. Most of the responders mentioned that the procedure cost was around 1644–3294 USD. In contrast, Micro-TESE was less commonly performed and the cost ranged from 6570 to 13,150 USD. Regarding ART costs, 16% underwent IUI once, 15% had IUI >4 times. In 31% of the IUI cases, the cost was 1,644 USD. With regards to ICSI intervention, it was carried out in 66% of the cases; with 32% of them did it 1–2 times and 12.5% of the cases did it >5 times. The cost of ICSI cycle ranged from 4937 to 16,457 USD.

Some patients (21.68%) decided to travel abroad for the treatment of male infertility. Most of those patients (53.5%) spent around 6591 USD while 24.1% of them spent 6591–16,476 USD. In addition, the majority of those patients (86.52%) paid their own expenses.

The majority of our patient (96.3%) did not have health insurance which covers male infertility investigations and treatment. Finally, when the patients were asked about the need for private or government insurance to cover male infertility, 141/145 participants said “yes,” 3/145 said “no,” and 1/145 said “I don’t know.” Considering the overall cost of male infertility investigations and treatment, the patients paid, on average, around 18% of their annual income, excluding major surgeries such as varicocelectomy and TESE. Data are presented at Table 1.

DISCUSSION

Infertility is a common health problem that necessitates multiple costly investigations and interventions. This survey study aimed to estimate the cost of different investigations

and interventions of male infertility. The cost of semen analysis, hormonal tests, imaging studies, and chromosomal test were calculated. The cost of medications exceeded 988 USD while the cost of surgical interventions ranged from 1644 to 13,150 USD. Most of the patients did not have health insurance to cover this financial burden. Hence, around 97% of them desired an insurance coverage.

Since male infertility care is not financially supported by most of the insurance plans, infertility care is costly. In 2011, the follow-up of 391 women presenting for infertility care revealed that more than half of them underwent *in vitro* fertilization (IVF) with an average cost of 30,274 USD. In addition, the average cost of IUI was 7704 USD while the fertility medications cost was 1403 USD.^[8] In another survey, study of 111 men seeking fertility, 64% of the patients reported expense equal to or >15,000 USD, while 16% of the patients reported spending equal to or >50,000 USD. Overall, the patients declared spending 16%–20% of their income on infertility-related health-care measures.^[9] In our study, the patients reported spending around 18% of their income.

Insurance coverage for infertile males is essential for both couples. Hence, the ASRM and the National Institute for Health and Care Excellence UK recommend that both couples should undergo infertility assessment together.^[10] Skipping male infertility from insurance coverage represents a huge burden on the overall infertility costs. The management of male infertility can be cost-effective manner and a reliable method of achieving pregnancy.^[11]

Since male infertility represents more than half of infertility reasons, insurance coverage can provide various benefits. For instance, supported governmental programs will allow in recognizing and treating the reversible causes of male infertility. In addition, this will assist in the detection of irreversible cases that necessitates ART as well as identifying associated comorbid conditions with male infertility. Health-care professionals will be also able to identify the irreversible problems where males’ sperm are not attainable. It is plausible that lack of insurance coverage of male infertility will preclude earlier infertility assessment which may worsen the general patient’s condition. Furthermore, excluding men from insurance coverage will lead to inability to recognize associated comorbid conditions with male infertility, which would definitely affect the management outcomes.^[12]

In the current study, we have not assessed the associated comorbid conditions among included patients; however,

Table 1: Percentage and cost of different management modalities

Aspect	Percentage	Cost in USD
Commonest monthly income	48.9	3293-6586
Commonest number of OPD visits (5-10)	38	132-263
Commonest number of semen tests (5-10)	35.6	29.6-32.8
Commonest hormonal tests 1-3 times	51.4	164.5
Chromosomal analysis test	37	658
Scrotal ultrasound	50	131.8-164.7
Medical therapy	62.8	988.74
Intrauterine insemination	15	1644
Intracytoplasmic sperm injection	66	4937-16457
Least total cost if patient did all above	18 of average income	8749

OPD: Outpatient department

multiple studies have indicated the presence of different pathologies in conjunction with male infertility. In a retrospective analysis of 536 infertile male patients, 33 patients (6%) had serious medical conditions such as testicular and prostate tumors, diabetes mellitus, hypothyroidism, cystic fibrosis, and chromosomal abnormalities.^[13] This is consistent with multiple epidemiological studies. For instance, observational studies have deduced that male infertility is associated with a high risk of subsequent incidence of testicular and high-grade prostate cancers.^[14,15] In addition, married men who got no offspring have a greater risk of dying from a cardiovascular disorder compared to men who had children.^[16] In accordance, considering the associated medical conditions is substantial when determining the insurance coverage.

Apart from cultural and religious beliefs, fertility in Kuwait and other Arabian Gulf nations is essential. Not surprisingly, most of Kuwait population would choose to have multiple children. The cost of male infertility investigations and treatments is expensive but Kuwait is one of the Arabian Gulf states with high income according to the World Bank classification. Nonetheless, our study revealed that enrolled patients, on average, paid around 18% of their annual income for infertility investigations and medications excluding major surgical interventions like varicocele and TESE. Although Kuwait has supported health-care system, there are limited reproductive health centers. Further and more importantly, these centers are restricted to Kuwait citizens and the patients have to wait for long periods to be examined. In addition, governmental hospitals in Kuwait may not consent the IVF or ICSI if the patient had one child.

There is mounting evidence that providing insurance for infertility care could be financially valuable for health care systems. In the United States, around 30% of deliveries from ART resulted in multiple birth pregnancies, this percentage is markedly higher in Europe and Australia, which offers full insurance coverage.^[17] Providing insurance by the government would allow to lessen the number of multiple pregnancies and embryo transfers. In 2003, the Belgian government proposed an insurance program of ART with specific limits on number of embryo transfers. This program resulted in >50% decline in multiple pregnancies rate.^[18]

It is noteworthy that the data of male infertility coverage in different countries are scarce.

In the Ontario-Canada, three cycles of IVF are supported for females and the authorities are willing to expand the

IVF indications. However, they have not considered male infertility treatment or investigations.^[7] In contrast, the Québec offered extensive coverage of infertility investigations and treatment for both genders.^[7] In Europe, the insurance policy and health protocols vary among different countries; however, there is higher access to infertility services compared to the United States.^[19] Insurance laws alterations, are therefore, fundamental to ameliorate the quality of life among Kuwait population.

To the best of our knowledge, this study is the first cost-analysis study among male infertility cases in Kuwait and Arabian Gulf countries. However, it has been limited by several limitations. First, this survey study targeted a small number of infertile male participants. Second, there was a shortage of information concerning the comorbid medical conditions among enrolled patients. Finally, this study lacked for a control group and randomization measures. Therefore, Future large-scale randomized studies are recommended to extensively evaluate male infertility management costs. The presence of a control group such as low- and high-income patients may assist in further understanding of financial issues and precise implementation of different insurance coverage.

CONCLUSION

Male infertility is a medical condition that causes a huge burden on the Kuwait community. Effective management necessitates insurance coverage and public health support owing to the huge financial burden on the patients and their partners. Health-care policymakers, should therefore, re-evaluate their protocols of spending on male infertility investigations and interventions. Future studies with larger sample size are warranted to reinforce the knowledge and understanding regarding male infertility cost burden and the appropriate insurance.

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Conflicts of interest

There are no conflicts of interest.

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