International Journal of Gynecology and Obstetrics 128 (2015) 14–17

Contents lists available at ScienceDirect

International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo

CLINICAL ARTICLE

Indications for in vitro fertilization at a public center for reproductive health in Campinas, Brazil

Marcia Pantoja, Arlete Fernandes *

Gynecological Division, Department of Obstetrics and Gynecology, School of Medical Sciences, University of Campinas, São Paulo, Brazil

ARTICLE INFO

Article history:
Received 9 January 2014
Received in revised form 9 July 2014
Accepted 22 August 2014

Keywords:
Infertility
Infertility factors
In vitro fertilization (IVF)
Tubal factor

ABSTRACT

Objective: To assess the sociodemographic profile and gynecologic and obstetric characteristics of women referred to a public reference center in Campinas, Brazil, for in vitro fertilization (IVF). *Methods:* Women referred between April 1, 2008, and October 31, 2009, were eligible for inclusion in a cross-sectional study. Participants were interviewed about sociodemographic characteristics, obstetric and gynecologic history, and etiologic factors resulting in the referral. Preliminary clinical examinations performed elsewhere were evaluated. *Results:* A total of 176 women were included, of whom 129 (73.3%) presented with tubal factor infertility. Tubal ligation had been performed in 66 (37.5%) women. Overall, 121 (68.8%) women were aged 30 years old or less, 110 (62.5%) had received more than 8 years of schooling, 123 (69.6%) had had infertility for up to 5 years, and 99 (56.3%) did not have any children. Moreover, 25 (14.2%) women had endometriosis and 25 (14.2%) had a male factor issue. A previous ectopic pregnancy was reported for 20 (11.4%) women and pelvic inflammatory disease for 49 (27.8%). *Conclusion:* Tubal factor infertility was the most common indication for IVF. Preventive measures are required, in addition to policies that ensure access to high-complexity treatments in the public sector.

1. Introduction

Infertility is defined as the inability to conceive after 1 year of regular intercourse without contraception. It has been acknowledged by WHO as a global public health issue [1]. Technological progress in the field of assisted human reproduction has produced new medical, ethical, social, and economic issues that require attention from health professionals and society at large, especially in low-income countries, where prevalence of infertility is high, yet financial resources are too scarce to provide affordable services [2,3].

The overall mean prevalence of infertility was estimated as 9% on the basis of a sample of 172 413 women from 25 high- and low-income countries [4]. Demographic census data from the USA [5,6] showed a significant decrease in the prevalence of infertility, from 8.5% in 1982 to 7.4% in 2002, although some estimates were as high as 15.5% depending on the method of calculation. Despite the overall reduction, rates remained high in some subpopulations such as older women, those without a college degree, nulliparous women, black women, and women of Latin American origin. In Brazil in 2010, there were approximately 50 million women of reproductive age [7], which means that the total number of women affected by infertility was 4–7 million, assuming an infertility rate of between 8% and 15%.

In vitro fertilization (IVF) is targeted at infertile couples with no other treatment alternatives. In general, these couples have tubal factor infertility or severe male factor infertility and have not achieved pregnancy after use of low-complexity treatments for some time, such as gonadotropins to induce ovulation and homologous intrauterine insemination. Data from the National Assisted Reproductive Technology Surveillance System [8] revealed that 147 260 assisted reproduction treatment procedures were performed in 443 US fertility clinics in 2010, with 47 090 live births—a success rate of 32.0%. However, IVF is expensive and tends to be provided by private health services, limiting access to high-income couples.

Low- and middle-income countries generally do not have the resources to offer this type of treatment free of charge. The Brazilian public healthcare system (the Unified Health System, or Sistema Único de Saúde) is organized such that patients begin with primary-care services and are directed to higher centers. Under the Brazilian Constitution, the Unified Health System must guarantee free access to every treatment procedure, including high-complexity procedures such as IVF.

The state of São Paulo is located in the southeast region of Brazil and is the highest national income generator, with a gross domestic product of US$200 billion and a Human Development Index of 0.805 [9]. The state has six public health centers that provide high-complexity infertility treatments, but there are no data on the populations referred to these services. The objective of the present study was to assess the sociodemographic, gynecologic, and obstetric characteristics of women referred for IVF to a public reference center in Campinas, a city in São Paulo.

* Corresponding author at: Caixa Postal 6181, 13084–971, Campinas, São Paulo, Brazil. Tel.: +55 19 3289 2856; fax: +55 19 3289 2440.
E-mail address: arlete@fcm.unicamp.br (A. Fernandes).

http://dx.doi.org/10.1016/j.ijgo.2014.07.022
0020-7292/

2. Materials and methods

The present cross-sectional study was conducted at the Gynecological Division of the Department of Obstetrics and Gynecology at the School of Medical Sciences, State University of Campinas, São Paulo, Brazil. This division is a reference center for infertility treatment, serving an area of 42 cities covered by Regional Health Department 7 of the São Paulo State Health Secretariat, with a population of approximately 4.2 million. Women who had been referred to this center for IVF treatment between April 1, 2008, and October 31, 2009, were potentially eligible for inclusion. Women with a uterine factor or pathologies that represented a contraindication for IVF were excluded. The project was approved by the institutional review board of the university and all participants signed a free and informed consent form.

One investigator (M.P.) administered a previously tested questionnaire to participants to obtain information about their sociodemographic characteristics, obstetric and gynecologic history, and infertility factors. Preliminary clinical examinations performed at the primary/secondary health services from where the women had been referred were evaluated by M.P. and A.F.

The diagnoses considered to be indications for IVF treatment were: tubal factor infertility, defined as bilateral tubal obstruction detected by hysterosalpingography or laparoscopy; male factor infertility, defined as a sperm count of less than 5 million per mL measured after sperm capacitation; ovulatory factor infertility, defined as absence of ovulation with follicle-stimulating hormone and human menopausal gonadotropin induction, or ovulation response to induction but three or more failures with homologous intrauterine insemination; endometriosis, defined by anatomopathologic changes or a surgery report of an endometriosis diagnosis; and unexplained infertility, defined as the absence of infertility factors after a complete preliminary infertility investigation and no success after three cycles of low-complexity treatments.

The following variables were studied: age group (≤24 years, 25–29 years, 30–34 years, and ≥35 years), ethnic origin (white or other), schooling (≤8 years or >8 years), duration of infertility (≤5 years, 6–10 years, and >10 years), number of pregnancies (0, 1, 2–3, and ≥4 pregnancies), number of living children (0, 1, 2–3, and ≥4 living children), antecedent ectopic pregnancies, number of partners in life (≤2, 3–10, and >11 partners), pelvic inflammatory disease (PID), history of curettage for spontaneous abortion, pelvic/abdominal surgery (for ovarian cysts, endometriosis, appendectomy, or cholecystectomy), smoking habits, illicit drug use, and presence of infertility factors (tubal factors, endometriosis, male factors, ovulatory factors, and unexplained infertility).

The analysis was performed using SPSS version 20.0 (IBM, Amonk, NY, USA). The women were divided into two groups according to the presence or absence of tubal factor infertility, and the Pearson χ^2 and Fisher exact tests were used for comparison between the groups. $P < 0.05$ was considered statistically significant.

3. Results

A total of 176 women were included, of whom 56 (31.8%) came from cities outside the coverage area of the center. Tubal factor infertility affected 129 (73.3%) women, and tubal ligation had been performed in 66 (37.5%). Overall, 121 (68.8%) women were aged 30 years old or less, 110 (62.5%) had received more than 8 years of schooling, and 123 (69.9%) had had infertility for up to 5 years (Table 1). Approximately 80% of the women aged 35 years or older had undergone tubal ligation, whereas younger women (aged ≤29 years) were more likely to have no tubal factor infertility or tubal factor infertility without tubal ligation (Table 1). Women with tubal ligation had fewer years of schooling (≤8 years) and a shorter duration of infertility (≤5 years) than did others (Table 1).

Among the 176 participants, 77 (43.8%) had primary infertility and 99 (56.3%) did not have any living children. Higher numbers of pregnancies and living children were concentrated in women with tubal ligation (Table 1). Among those with primary infertility, 37 (48.1%) had tubal factor infertility. The groups differed in terms of their obstetric and gynecologic history: 21 (11.9%) women had undergone curettage for spontaneous abortion, 12 (57.1%) of whom had undergone tubal ligation; and 20 (11.4%) women had had an ectopic pregnancy, of whom 16 (80.0%) had tubal factor infertility without tubal ligation.

Pelvic/abdominal surgery had been undertaken because of endometriosis in 17 (9.7%) women, ovarian cysts in 13 (7.4%), appendectomy in 8 (4.5%), and cholecystectomy in 4 (2.3%). A history of PID was mentioned by 49 (27.8%) women, but the frequency did not differ between the groups with and without tubal factor infertility ($P = 0.25$) (Table 1).

Overall, 18 (10.2%) women had undergone assisted reproduction treatment at least once previously; all previous treatments had been performed by private services. Eleven (6.3%) women had undergone three cycles of homologous intrauterine insemination and 9 (5.1%) had undergone one or more IVF procedures.

In the total sample, 16 (9.1%) women had more than one infertility factor. Endometriosis was present in 25 (14.2%) women, 13 (52.0%) of whom presented with a concurrent tubal factor. Of the 25 (14.2%) couples with male factor infertility, only 2 (8.0%) had a concurrent tubal factor. Other infertility factors occurred in less than 5% of the sample (Table 2).

4. Discussion

In the present study, most women referred for IVF treatment were aged at least 30 years, which is in agreement with findings from other Brazilian studies [10,11] that evaluated women participating in IVF programs. However, the level of education was higher and the duration of infertility shorter in the present study than in the previous reports [10,11]. The fact that the women had had infertility for a shorter time indicates that they had a high income, which is reinforced by the finding that 10% of the participants sought public sector treatment at the study center after having undergone assisted reproduction treatment in the private sector. Because IVF is expensive, many couples cannot afford it or are unable to pay for more than one treatment cycle, and are consequently referred to a public service. The study center is located in a region with fairly high development indicators; therefore, the results are probably not representative of populations referred to other regional public services.

Some characteristics of the women in the present sample are similar to those observed in high-income countries. In a UK study [12], half the interviewed infertile couples had an indication for IVF or intracytoplasmic sperm injection, the mean duration of infertility was 18 months, and the mean age of the women was 31 years. The infertile women in a study carried out in Finland [13] had an urban dweller profile, with a high educational level, an advanced age, and a high prevalence of tubal factor infertility.

The prevalence of tubal factor infertility in the present study was high, as would be expected for a reference center for IVF treatment. The etiology of tubal factor infertility was equally divided between infectious/inflammatory processes and tubal ligation. Among the women with primary infertility, 48% presented with a tubal factor. This rate is high and is similar to frequencies reported for low-income countries [14,15] where rates of sexually transmitted infections and PID are increased, leading to higher numbers of couples seeking IVF treatment. Of the 49 women with PID, 21 (42.9%) had bilateral tubal obstruction without tubal ligation, as did 16 (80.0%) of the 20 women with previous ectopic pregnancy. These results corroborate the direct association between one or more PID episodes and bilateral tubal obstruction shown by Weström [16].

One of the causes of tubal factor infertility is unsafe abortion, which was not investigated in the present sample. The present study aimed to evaluate the frequency of abdominal and pelvic surgery and of medical procedures that involved manipulation of the uterine cavity. However,