

The consequences of the Covid-19 global pandemic on Medically Assisted Procreation: the Italian experience

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Abstract. All over the world, the COVID-19 pandemic, caused by the SARS-CoV-2 virus, had a strong impact on Medical Assisted Procreation (MAP) procedures. Indeed, these services were stopped at the beginning of March 2020, with a reduction in their activity of 34.8%, as many specialized centers were transformed into Covid hospitals to face the pandemic emergency. In Italy, law 40/04 applies in infertility cases; however, during the pandemic, it was the first European state to discontinue MAP treatments and among the first to resume from May 2020. Through a survey of the National MAP Registry, a significant decline in MAP activities compared to 2019 has been highlighted, along with a decrease in thousands of new births. This situation has revealed concerns about the management of assisted reproductive treatment. Many Italian regions present few dedicated centers related to the demand, increasing the phenomenon of “reproductive tourism” in the northern regions where these centers are more widespread. This study aims to evaluate the effects of the interruption of assisted reproduction and compare it with other countries and evaluate the need to implement economic resources to improve and expand MAP centers.

Keywords: Infertility, Medical Assisted Procreation, Covid-19 pandemic

Introduction

In March 2020, the Severe Acute Respiratory Syndrome Coronavirus 2 (Sars-CoV-2) caused a worldwide pandemic, as declared by the World Health Organization (WHO) (1). The pandemic outbreak immobilized the Italian and European healthcare systems, directly and indirectly impacting public health. Firstly, many health facilities were closed to prevent and avoid the contagion, and clinical departments drastically reduced their hospitalizations to prioritize the huge flow of Covid-19 patients. The Italian Government recruited both retired and newly graduated physicians to help specialists face the Sars-CoV-2 consequences. Secondly, the risk of contagion precluded many patients from undergoing even the ordinary clinical examinations and diagnostic tests within

hospitals. In this regard, in 2020, there was a strong decrease in new diagnoses in Italy, while, on the other hand, there was an increase in mortality secondary to pathologies with standardized treatments (2), such as myocardial infarction (3) and cancer. All over the world, non-essential services were stopped in March 2020, including Medical Assisted Procreation (MAP), which was reactivated in May 2020. During that period, the American Society of Reproductive Medicine (ASRM) recommended postponing the initiation of new treatment cycles to achieve pregnancy (4). In Italy, Law n. 40 of 2004 guarantees the right to MAP in case of infertility (5), but the right to assisted reproduction has inevitably suffered pandemic consequences.

The Italian paper concerning medically assisted reproduction services showed the number of procedures performed. They are distributed on three lev-

els: Level I MAP techniques (simple insemination) and level II and III (extracorporeal fertilization, i.e., embryo formation in vitro), both with gametes of the couple or with gametes from the donor (one or both gametes of an external donor pair). The use of embryos consisting of non-cryopreserved gametes falls within the so-called “fresh techniques”. MAP centers are also divided into three levels. Level I centers are those where only level I techniques are performed. Level I, II, and III techniques are performed in level II and III centers. The differences between the centers are justified by the different types of anesthesia practiced. Level II center’s procedures are performed under local anesthesia and/or sedation, while level III centers carry out procedures that require general anesthesia with intubation.

This study aims to assess the consequences of the interruption of the right to assisted reproduction, including comparison with other countries, to examine the measures to solve this issue. First, the authors will discuss the “report to parliament on the state of application of Law 40”, concerning the period 2019 – 2020 (6); then, data from other countries will be analyzed to understand if there has been a significant decrease in assisted reproduction procedures in Italy (7).

Materials and methods

Since the enactment of Law 40, the report on the status quo of the law on Medically Assisted Procreation has been drawn up every year. The 2021 report describes the activities carried out by fertilization centers throughout the Italian territory. Data provided by the individual regional institutes were used to analyze the number of procedures carried out in 2019.

To assess the impact of the COVID-19 pandemic on the activity of MAP centers, the National MAP Registry carried out a survey that recorded a high participation rate, reaching 92.1% of the centers. The survey was based on a cognitive questionnaire developed by the staff of the Registry and addressed to the II and III level Centers, which apply more sophisticated methodologies with in vitro fertilization (IVF) and embryo transfer procedures, intracytoplasmic single sperm injection (ICSI), surgical sperm sampling tech-

niques and cryopreservation of gametes and embryonic. The questionnaire was an electronic compilation form. This form has been uploaded on the website of the national MAP register of Italy, in a specific area reserved for the directors of MAP centers. Finally, the results of the survey were attached to the annual report.

Results

Italian centers of Medical Assisted Procreation

In Italy, there are 346 active centers:

- 106 are public facilities,
- 20 are private facilities affiliated with the national health system
- 220 are exclusively private facilities.

61% of the active Italian centers are concentrated in 5 regions, such as Lombardy with 58 centers (16.8%), Campania with 45 centers (13%), Veneto, Lazio, and Sicily with 36 centers (10.4%). Lombardy is the region with the largest activity in Italy (27.6%). The activity of II-III level MAP centers with homologous fertilization is supported by the National Health System in 67.6% of the cycles started (38.9% public centers; 28.8% private affiliated). About one patient out of 4 (27.6%) turns to another region to undergo the MAP, to public centers in Tuscany, Lombardy, and private centers in Lazio.

State of the art in 2019

In 2019, 82.476 cycles of II-III level MAP were started (2.742 cycles more than in 2018), of which 73.481 with homologous fertilization (1.490 cycles more than in 2018) and 8.995 with heterologous fertilization (1.252 more cycles). In 2019, there were 21.593 canceled cycles, corresponding to 42.9% of the total cycles started with fresh method, with an increase of 2.8% compared to 2018. As for newborns, 14.753 pregnancies were obtained from second and third-level techniques without gamete donation. Of those, “fresh techniques” were applied 7.753 times, while the frozen technique was used 7000 times, of which 6.758 with the FER (Frozen Embryo Replacement) technique and 242 with the FO (Frozen Oocyte) technique. In

2019, 1.767 pregnancies were obtained from first-level techniques.

In Italy, a sort of “tourism of reproductive services” was observed, as 27.3% of the cycles started with fresh techniques were carried out on patients who did not reside in the region to which the center belongs. The most involved public centers are in Tuscany and Lombardy, while most private centers are in Lazio.

COVID-19 impact on MAP activity: state of the art in 2020

For the year 2020, the services and staff in charge of carrying out the MAP procedures have been involved in facing the COVID-19 pandemic. Most of the centers (77.8%) suspended all types of activities (in March 2020) without starting new cycles and completing, in some cases, the ongoing treatments by freezing oocytes and embryos or with embryo transfer.

20.5% of the centers suspended all MAP treatments, and 21.0% of MAP centers have made their own structure available to create Covid-19 department, so-called “Covid Centers”. Only three centers declared that they did not completely suspend their activity during the lockdown; however, they reported a sharp decrease. The only activity that continued was counseling and cryopreservation procedures of gametes to preserve fertility in oncological patients.

In general, during the first quarter of 2020, there was a reduction of 9500 MAP cycles; compared to 2019, there was a reduction in the activity of 34.8%.

In the survey, the authors hypothesize two possible scenarios. In the first case, if the activity remains unchanged, they estimate a reduction of 26800 cycles, with a decrease in the birth rate of 4200 newborns by II/III level MAP techniques. In the second scenario, a 15% reduction in activity in the remaining period of 2020 leads to a reduction of 15,000 cycles and the birth of 2400 children.

The European Society of Human Reproduction and Embryology (ESHRE) made a survey during the Covid-19 pandemic in which national representatives were asked about the status of ART (Assisted Reproductive Treatment) activity in their respective countries.

They collected data from 41 out of 51 European countries. The first country that stopped ART activi-

ty was Italy, as of the 1st of March 2020. After that, many countries partially and/or totally discontinued new treatments. ART activity was paused for an average of 48.76 days (min 23 to max 92 days), based on data from 37 countries for which the exact stop and start date of activity were available from the survey consultation. No more data were available about new cycles, new pregnancies, and newborns related to ART during 2020.

Discussion and conclusion

In 2019 national activity indicators measuring MAP activity for level II and III techniques per million women of childbearing age and per million resident inhabitants were steadily increasing. There were 7,697 cycles per million fertile women (1,341 cycles per million inhabitants) compared to 7341 per million women of childbearing age in 2018, even higher than the European average. Moreover, data recorded by European countries with an activity of more than 40,000 cycles started, and therefore comparable with the activity that takes place in Italy, were 9,066 cycles in France and 5,240 cycles in the United Kingdom.

During the Covid-19 pandemic, in the first quarter of 2020, 9.500 fewer cycles with MAP techniques were started, with a reduction in activities equal to 34.8% compared to the data relating to the first quarter of 2019. It is estimated that the impact of the pandemic on MAP activity in the first quarter of 2020 could lead to a reduction in births of about 1.500 newborns compared to 2019. In Italy, the phenomenon of “fertilization tourism” was very consistent, as there has been a migration of patients from southern to northern Italy to undergo MAP treatments (8).

During the pandemic, in Europe, Italy was among the first to suspend treatments as a precautionary measure and was among the first to restart MAP activities (9).

Considering the European scenario, fewer medically assisted procreation procedures have been carried out in Italy than in other European countries; however, the total number of MAPs is in line with the continental average. On the one hand, it is necessary to consider the social, cultural and religious characteristics of the Italian population; on the other hand, the parliamen-

tary report on the state of application of Law 40 shows that many regions have few centers compared to the total regional population; moreover, the phenomenon of reproductive tourism is now common, which further increases this discrepancy. These data reflect the lack of trust of citizens towards MAP centers close to their residence and the poor receptive capacity of the latter (10). From the report mentioned above, we learn that the funds for medically assisted procreation in Italy decreased consistently with the reduction in new MAP cycles imposed by the pandemic in Europe (11). On the Italian territory, this trend implies a decline in thousands of new births (12).

Italy's behavior during the pandemic outbreak was coherent with that of neighboring countries. The closure of MAP centers and the contraction of their activities show the great commitment of physicians, who have significantly reduced their activities to face a global health emergency in an adequate and supportive way (13). From reported data, Italy has provided the best access to assisted procreation despite the ongoing health emergency compared to other European countries (14-20); but the consequences of the pandemic will be seen in the coming years. Italy will have to do everything possible to guarantee the right of access to the MAP and allow an increase in births, starting with an increase in the allocation of public funds intended to implement MAP centers, especially in the regions most affected by the migratory phenomenon of "reproductive tourism" (21-24).

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