

# Influence of the awareness of COVID-19 pandemic on assisted reproductive technology clinic in Africa, South of the Sahara

## Abstract

**Introduction:** COVID-19 pandemic has taken the world by storm and consequently, various reproductive medicine societies had since issued guidelines based on best judgement for the safety of IVF patients and attending health staffs

**Objective:** The objective of this study was to assess the opinions of IVF staff in sub-Saharan Africa on the awareness of COVID-19 on Assisted Reproductive Technology. The study also evaluated some of the measures that can mitigate the effects of the virus in IVF clinics.

**Methodology:** Different cadres of staff at Nordica Fertility Center (NFC) in Lagos, Nigeria were interviewed. Those interviewed included the Medical Director, Clinicians/Gynecologists, Clinic Manager, Nurses, Embryologists, Counsellor, Business Developing Unit, Client Liaison Officers and Accounts Officer. Their responses were collated, and the key points were documented. Each staff in face mask was visited by one interviewer who observed all government-recommended sanitary precautions including wearing a facemask and maintaining social distance between her and the interviewee.

**Result:** The response of the MD on the fate of IVF clinic in Africa within the next 6 months to 1 year of the Covid-19 pandemic was that the overall economy is a major determinant of the ability of clients to pay for IVF services. Infertile women would still want to have children but "how would they pay for the services?" since ART is not subsidized by the government but mostly paid as out-of-pocket expense in this part of the world. The main points were that IVF clinics are not immune to the economy and vaccine may or may not favor IVF, reasons being;

- (i) The virus is about 5 months old hence still much to be discovered
- (ii) There is no solid evidence that the virus affects reproduction
- (iii) No evidence of mother-to-child transmission and
- (iv) The virus can survive in cold environment therefore, it could survive cryopreservation.

The embryologist was of the opinion that IVF clinics in Africa need to understand the virus more to decide whether:

- (i) Attend to COVID-19 patients or not and if so, how best to care for them
- (ii) Better prepare modalities of cryopreservation such as
  - a) Appropriate equipment
  - b) Batching gametes together with HIV or Hepatitis patients

**Abbreviations:** NFC, nordica fertility center; MD, medical director; Covid-19, coronavirus diseases 2019; SARS-CoV2, severe acute respiratory syndrome coronavirus 2; ART, assisted reproductive technology; PPE, personal protective equipment; BDU, business development unit; CM, clinic manager; CLO, client liaison officers; NFC, nordica fertility center; SOPs, standard operating procedures

## Introduction

Africa is not exempted from the global restrictions on freedom of movement imposed due to the recent pandemic of a novel disease,

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- c) In same or separate equipment and
- d) Getting special cryo-tanks for Covid-19 patients.

Embryologist agreed that clinics will be able to perform other adjunct fertility treatment such as Pre-implantation Genetic Diagnosis (PGD), dependent on clinics' ability to have separate equipment for Covid19-positive and negative patients.

**Conclusion:** Africa is not left behind in experiencing the effects of COVID-19 and ART, for which concerns for the survival of privately owned clinics to ensure and safeguard the health and safety of patients, staff and the unborn babies are expressed. As of now, no-one is sure of patients that are symptomatic and those not symptomatic, as testing in the country, just like in most parts of the world, are still inadequate. When a vaccine is available, it may be mandatory for every IVF patient to get a shot. The main points of other cadres of staff are discussed.

**Keywords:** COVID-19, Economy, Cryopreservation, Vaccine, Pre-implantation Genetic Diagnosis, Adjunct Fertility Treatment

Coronavirus or Covid-19. Since the world was alerted in January of 2020, that the virus has started spreading from Wuhan, China, there have been many severe cases that required emergency treatment to the extent that healthcare system in some countries were on the verge of collapse due to the massive admission rates. The Covid-19 pandemic in Nigeria is part of the worldwide pandemic of coronavirus diseases 2019 (Covid-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) which was first announced in the country on 27 February, 2020, in an Italian citizen that tested positive to the virus.<sup>1,2</sup> The subsequent widespread of the disease became a panic situation which led to the validation for the implemented

limitations, and societies, associations and organizations concerned with reproductive medicine responded by delivering professional direction grounded on best decision. These bodies decisively agreed on certain crucial recommendations for reproductive medicine practitioners around the globe, which incorporate deferment of new fertility treatments such as “ovulation induction, intrauterine insemination (IUI), in vitro fertilization (IVF), non-urgent gamete cryopreservation” and, “cancellation of all fresh or frozen embryo transfers, and suspension of elective surgery and non-urgent diagnostic procedures”.<sup>3,4</sup> Only clients who were currently ‘in-cycle’ or who required urgent fertility preservation due to cancer treatment were exceptions to these recommendations. Italy, incidentally, is one of the countries hardest hit by the pandemic. Alviggi et al.,<sup>5</sup> probably studying the situation in that country were concerned that prolonged lockdown and restriction of movement will negatively affect fertility treatment. Since global fertility community was unsure of provision of optimal care for infertile patients during the pandemic, Alviggi et al.,<sup>5</sup> proposed strategies to mitigate the long-term consequences of a prolonged cessation of infertility treatment and to help regulatory authorities and health care providers identify which patients might be prioritized for the continuation of fertility care in a safe environment. Data on the effect of the pandemic on IVF treatment in Africa is non-existent hence the objective of this paper was to document perceived influence of the Covid-19 pandemic on Assisted Reproductive Technology (ART) Clinics in sub-Saharan Africa. The views of health and non-health workers might give an insight into how the pandemic altered clinical settings, affected in-flow of patients, increased expenditure, and reduced income for the facility.

## Methodology

This study took place on 16<sup>th</sup> May 2020 when the Covid-19 pandemic has been well-established in Nigeria and other parts of the world. The study employed a qualitative technique that simulate key informant interview. In April, a panel was constituted to draw up certain questions, based on doctor-patient relationship in the new era of the pandemic, to examine the possible effect the pandemic has or is expected to have on Assisted Reproductive Technology (ART) in sub-Saharan Africa. Different cadres of staff of Nordica Fertility Center were interviewed. Both the interviewer and the interviewee followed WHO-specified protective measures by wearing appropriate face masks, face shields personal protective equipment (PPE) and kept a distance of about 2m from each other. Offices used for the interview and the recording instruments were well sterilized. In all, 14 staffs, including 2 Client Liaison Officers (CLO), 2 Nurses, 3 Embryologists, 2 persons in Business Development Unit (BDU), 3 Doctors, 1 Clinic Manager (CM) and 1 Finance Officer were interviewed. The questions directed to each category of participants are:

### a. To the nurses:

- (i) Do you think measures can be put in place to combat the possible transfer of the disease from client to medical personnel during theatre procedure? If yes, what kind of measures?
- (ii) As a fertility nurse with close relationship to clients, how do you they feel halting, holding or disrupting their treatment?

### b. To embryologists:

- (i) If a vaccine is not found in the coming month, will IVF organization have the capacity and necessary equipment to cryopreserve the gametes and perform other adjunct fertility treatment like PGD.

- (ii) What are the protective measures put in place in handling body fluids such as semen and blood samples.
- (iii) As an embryologist, how do you care for frozen oocytes and embryo during this coronavirus pandemic.

### c. To medical doctors/gynecologists:

- (i) In the eventuality of a vaccine, would it be appropriate to ask all clients to have taken vaccine before procedures are done?
- (ii) Has there been a notable difference in communication and understanding from the clients in physical consultation and on-line consultation? What measures can be put in place for newly infected clients who have had successful treatment but still require scans and support?
- (iii) As a doctor, how do you think the pandemic has affected patients here in Africa?
- (iv) How have you been able to manage clients who have been recommended to undergo surgery such as hysteroscopy during/ before their IVF treatment.
- (v) How do you protect yourself during patient evaluation and theater procedures.
- (vi) Will the IVF organizations be able to care for and treat individuals with the virus who present as emergency for fertility treatment with diseases such as cancer or AIDS?
- (vii) What do you think will be the fate of IVF clinic in Africa within the next 6 months to 1 year of this pandemic?
- (viii) Concerning the economics and finance, do you think that people are becoming more aware of what we do and why we do what we do and how?
- (ix) If there is no vaccine within the next 6mths to 1 year, do you think the technology would favor IVF e.g. cryopreservation or gametes of people who have been infected (with the COVID-19)?
- (x) Is it also possible that we treat infected patients in a couple of months?
- (xi) If (when) a vaccine becomes available, should we make it mandatory for our clients to have had a vaccine before they consult us.

### d. To business development unit:

- (i) What are two of the biggest challenges the company has faced in terms of growth through this season?
- (ii) What are three of the most profound changes the company has gone through this season in terms of social presence and customer engagement?
- (iii) In what ways have you managed to stay relevant and essential to old and new clients in this season?

### e. To accounts:

- (i) What are some of the fiscal measures that can be taken to improve the inflow of revenue for the organization at this time?
- (ii) In what ways did the organization save money despite the holdback on incoming earnings?
- (iii) In three months, how much of an impact would you project that the virus would have made on the sector financially?

**f. To counselling unit:**

- (i) How would you describe the psychological effect and state of mind of clients that have to halt or defer their treatment?
- (ii) In what ways have your counseling techniques changed in respect to calming fear and fostering hope?

**g. Client liaison officers:**

- (i) Are there new developments that have occurred with respect to client-customer interaction that will continue to be taken as a norm going forward?
- (ii) Do you believe the quality of client engagement rendered have improved during this season and why?
- (iii) What is the first concern of a potential client when starting treatments during this time?

## Results

One of the biggest challenges faced by the facility is the reduced number of patients because of the fear of being infected with the virus within the premises of the facility and most especially because of government policy of “lock-down” which restricted everyone’s movement, impacting on the number of clients who would normally have come in for enquiries. The time has come for changes and everyone has gone online for communication and consultation. The channels of online communication were increased so clients can consult, pay and do almost all their businesses online with the facility. The facility thus had to intensify its activities on social media since a lot of people were at home and had more time to engage with the IVF clinicians, informing clients not only on their treatment but also giving them information on how they can cope psychologically with the pandemic according to WHO and NCDC specifications and setting up online webinars and seminars.

Client Liaison Officers (CLO) constantly communicates with clients who consult at Nordica Fertility Center (NFC). Since the inception of Covid-19, CLO has set up hand sanitizers at strategic places in the clinic which the patients are happy with, according to feedbacks from almost all clients. Further, all patients and their partners have a temperature check and are advised to wear face mask before entering the facility premises. Facemasks are provided to clients who did not have one and they are taught to wear it correctly to cover their noses and mouths. Clients who call through the telephone or who use social media such as “WhatsApp” are informed that the clinic is still open but necessary precautions must be taken according to WHO rules and regulations on the prevention of Covid-19 to make the clinic environment safe for clients and staff. During calls, patients are also educated on how to keep safe from Covid-19 infection. Potential clients often called to ask if the clinic is still open for consultation and what the facility has put in place to prevent clients being infected. This is because some private hospitals were sealed up for non-adherence to government regulation on prevention of Covid-19 and patients do not want to contact the infection within the facility if adequate protection has not been instituted. The clinic also uses online Fertility video to communicate with clients and potential clients. From the perspective of the nurses, some clients are happy that they have enough time to communicate with their fertility experts, since they, the clients, were not going to work while others are worried about their safety in the fertility clinic. Those who were eager with their fertility management visited the clinic to continue their treatment but others who were skeptical decided they would wait till after the pandemic is over for fear of nosocomial infection.

Nurses were optimistic that measures could be put in place to combat possible transfer of coronavirus from client to medical personnel during theater procedure, especially hand hygiene, though all nurses in the facility are used to the soap and water scrub they regularly carry out. In addition, the use of personal protective equipment (PPE) has been introduced to ensure that hands are covered. This is necessary because at times, when a conscious patient is in pain, she tends to hold the nearest nurse for comfort and in this instance, wearing gloves might not be an adequate protection against the transmission of infection. Patients under anesthesia do not manifest this phenomenon of trying to hold, for obvious reasons, though wearing a PPE is still essential. Further, strict respiratory hygiene has been put in place with the use of face mask and guard by every member of staff safe injection practices were re-emphasized, proper sterilization of all equipment was ensured, a very hygienic clinic environment was made compulsory with use of antiseptics for cleaning surfaces of furniture, railings, door handles and walls at everywhere clients and staff are likely to come into contact. Further, there was continuous education on the need for safety.

The Clinic Manager observed that getting people to wear mask at all or to wear it correctly was still problematic because a lot of people still do not understand why they need to wear a mask and some of them just see it as “they say we should wear mask.” This behavioral change is difficult because people are not used to wearing masks at all but now having to wear it constantly is difficult for them. She also noticed that Covid-19 has altered the pattern of staff meeting which used to be a gathering of staff at the conference room, but which now takes place virtually in each person’s office. The pandemic has forced the clinic to restructure its operation and consultation schedule. One of the areas of perceived problem brought about by Covid-19 in the IVF clinic is that of oocyte preservation.

Embryologists at NFC related how they have been able to solve some of these problems. One method put in place was to ensure that the cryotanks do not run out of liquid nitrogen as there is an automated alarm system put in place to ensure that this does not occur. One embryologist reported that despite unconfirmed studies that have shown that the virus does not bind to gametes and embryo, cryotanks are still protected from contamination in the laboratory and sperm-washing is always carried out to remove any virus or other contamination in the sperm cells. Embryologists follow standard operating procedures (SOPs) for good laboratory practices including use of goggles, disposable gowns, disposable caps and disposable gloves which are doubled before working on body fluid samples. and disposable caps. Laboratory staff do not touch their faces, ears, nose, or mouth and after working on body fluid samples, the entire laboratory is cleaned with already prepared disinfectant. The laboratory uses special filter to filter the air within the laboratory. To further prevent contamination of surfaces in the entire laboratory, samples are batched-processed, especially if such samples are not urgent. The head embryologist was of the opinion that, should a vaccine be unavailable in the near future, scientists would have gained a deeper understanding of the virus which will help to better prepare for any eventuality. She envisaged that IVF clinics worldwide would eventually decide whether to take in Covid-19 patients or not, depending on availability of equipment, such as cryo-tanks, which may need to be separated for infected and non-infected Covid-19 patients. The question could arise that should healthy gametes from healthy patients be cryo-preserved with gametes from those who are infected with other diseases such as coronavirus, HIV etc.? This will depend on better understanding of the virus which will determine whether to batch-preserve the gametes from Covid-19 patients with those of patients with other diseases such as Hepatitis



and HIV. She was of the opinion that the facility will still be able to perform other fertility treatment such as PGD depending on whether it will be necessary to acquire separate equipment for infected patients. Each clinic will have to decide all these issues individually.

The psychological effect of Covid-19 pandemic on patients that had to halt or defer their IVF treatment, a disturbing issue was discussed. Some of these patients felt devastated because they were not able to progress further with their treatment which had to be stopped because of the pandemic. Others who were financially ready to commence their treatment didn't want to stop the process, knowing they had a procedure to go through. This group of women became anxious and had fear of not being able to achieve their fertility goal at a particular time. This is because the clients had plans that within 2-3 months, they must have completed their treatment and probably become pregnant through IVF. The Covid-19 pandemic disrupted these plans and some of the clients became frustrated that their hopes had been dashed. The counsellor was of the opinion that no-one could really understand the extent of anxiety, fear and disappointment that these clients were having but psychotherapy attempted to make them feel relaxed, providing hope and telling them of situations of others who had to go through the same frustrating circumstances and how they were able to overcome their fears and uncertainties. One major concern of clients was whether they will surely get pregnant with IVF to which the Counsellor responded that the facility picks the best sperm and egg for fertilization with the hope that implantation continues in the healthy uterus. However, this has been an uphill task as clients want to have 100% assurance that they will get pregnant once they go through the IVF procedure.

The accounts officer was of the opinion that fiscal measure that can be taken to improve the inflow of revenue is to intensify efforts to strengthen relationship with clients, through direct telephone with someone the clients is conversant with and not making conversation strictly official but interspersed with personal enquiries. The facility has incurred more expenses since the pandemic started in regard to purchase of sanitizers, disinfectants, disposable face masks, gloves and PPE as well as communications. The virus had negatively impacted IVF business activities.

From clinicians perspective, those who were antibody positive for Covid-19 may not need to be vaccinated against the disease but if there is proof that clients are antibody negative, then they should receive Covid-19 vaccines, if and when it is available. Clients who were pregnant and also Covid-19 positive will not be stigmatized but will be prevented from infecting attending staff and other clients. Necessary procedures would still be conducted but this category of clients would be referred to a Covid-19-approved antenatal care provider, should one be available. The pandemic has affected IVF patients in Africa the same way it has affected other aspects of human life elsewhere as treatment has to be put on hold and visits to hospital have suffered because of fear of being infected. In some cases, some hospitals reject patients for fear of the pandemic being introduced into their facilities, elective procedures are suspended. Before, telemedicine was not popular in Africa because of accessibility to the internet, constant electricity and relevant technology but Covid-19 is changing this, and many facilities are using telemedicine to improve patient care. General recommendation worldwide is to suspend elective procedures such as hysteroscopy during the pandemic. One of the reasons for this is that Covid-19 is a new relatively unknown diseases which primarily affects the respiratory system and one does not know whether a patient under general anesthesia will wake up or not. It has not been palatable for patients whose IVF treatment had to be deferred because hysteroscopy had to be suspended. International

and national travel ban had also affected many procedures. For the time being, gametes are cryo-preserved, and all procedures suspended until the situation is clearer and the disease is better understood. A standard operating procedure (SOP) was put in place including wearing of face-mask, pre-screening of patients, travel history, history of fever, seating arrangement in the waiting-room, which all inform staggered appointment or whether clients needed to postpone their visit to the clinic or they could be seen on the day of consultation. AFRH, ESHRE and other professional bodies had issued guidelines on how to handle emergency cases that also come with Covid-19. In this case, their gametes could be frozen until the pandemic is over when the clients would be fully evaluated. The fate of IVF clinic in Africa within the next 6 months to 1 year of the Covid-19 pandemic is that the overall economy would be a major determinant of the ability of clients to pay for IVF services. Infertile women would still want to have children but "how would they pay for the services?" since ART is not subsidized by the government but mostly paid as out-of-pocket expense in this part of the world. The main points are that IVF clinics are not immuned to the economy and vaccine may or may not favor IVF, reasons being:

- (i) The virus is about 5 months old hence still much is to be discovered
- (ii) There is no solid evidence that the virus affects reproduction
- (iii) No evidence of mother-to-child transmission and
- (iv) The virus can survive in cold environment therefore, it could survive cryopreservation.

## Discussion

The Covid-19 pandemic has negatively impacted the health and economic sectors of most countries. Further, hospital services are labor-intensive, and a hefty proportion of hospital and specialized health services budget is spent on human resources.<sup>6</sup> This study is the first in Africa to report the effect of the pandemic on fiscal structure of a private health facility as it reported that the pandemic has negatively impacted the finance system of the hospital, corroborating what Nundoochan<sup>7</sup> reported that it has heavily impacted public health facilities as well. Although patients seeking IVF treatment expressed fear of Covid-19 throughout this report, Allotey et al.<sup>8</sup> reported that, compared with non-pregnant women or reproductive age, pregnant and recently pregnant women with Covid-19 were less likely to report symptoms of fever, indicating that infertile or non-pregnant women are more likely to manifest signs and symptoms of the disease. This may justify the fear of yet-to-be-pregnant women seeking IVF treatment to abstain from health facilities during the pandemic. The staff of the private health facility where this study took place were correct to continuously clean surfaces of furniture, door handles and walls with disinfectant to prevent contamination and cross-infection with coronavirus. This confirms the report of Jiang et al.<sup>9</sup> that demonstrated extensive environmental contamination of SARS-COV-2 RNA in hotel rooms. Because SARS-COV 2 remains viable and infectious from hours to days on surfaces,<sup>10,11</sup> contact with a contaminated surface potentially could be a medium for the virus.<sup>9</sup> One of the other major findings is that the facility of study has started telemedicine to communicate with its patients for consultations, webinars, seminars, and payment of fees. This agrees with what Ioo and Gallicchio<sup>12</sup> described in their study that to minimize contact and likely virus spread; a lot of physicians are now employing telemedicine for patient care without direct contact. This technique affords physicians to access patient records at the scene and determine if the patient is at a high-enough risk to be transported to the emergency department

or the emergency department will help the patient set up a follow-up appointment.<sup>13</sup> In line with global instructions, Nordica Fertility Center asks patients of their recent travel history to any high risk area, contact with who has or who was feeling sick and either offer relevant medical advice or refer them to appropriate and recommended government facilities catering for Covid-19 patients.

## Conclusion

The overall economy of the country is a major determinant of the ability of the patients to afford IVF services as these services are not immune to the economy. IVF services are not subsidized by the government but mostly paid as out-of-pocket expenses by clients. There is need to have a better understanding of the virus. Little is known about the coronavirus now and until an effective treatment is available to halt the transmission of Covid-19 and associated hospitalization, investments in disease surveillance, including large-scale testing and contact tracing, are unforeseen emergency priorities.<sup>8</sup> Procedures such as hysteroscopy and Pre-implantation Genetic Diagnosis are already postponed during this pandemic and would eventually depend on clinic's ability to have separate equipment for Covid-19-positive and Covid-19-negative patients. Intensive researches on the effect of Covid-19 on fertility management for both infertile females and males are needed to be carried out. Governments, international agencies and professional bodies should commission studies on how Covid-19 impacts fertility treatment in Africa.

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## Conflicts of interest

There was no conflict of interest regarding this study.

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