Original Article

The Impact of the Novel Corona Virus Disease on Fine Needle Aspiration Cytology Service in a Nigerian Tertiary Hospital

Ohayi SR

Department of Histopathology, Enugu State University Teaching Hospital and College of Medicine, Enugu Nigeria.

*Correspondence

Dr. Ohayi SR

Email: robhayi@yahoo.com

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ABSTRACT

COVID-19 widely believed to have started in Wuhan, China is a highly infectious disease which became a pandemic within few months of its first diagnosis. In the 42 weeks that it has lasted, about 46 million cases were confirmed with about 1.2 million deaths globally out of which 63, 173 and 1, 151 respectively occurred in Nigeria. Globally including our country and hospital, it has put a major strain on healthcare services with major disruptions in provision and uptake of these services and in people's lifestyle. Presently some adverse health consequences of these disruptions are known but many may yet to be discovered. The purpose of this study is to assess the impact of COVID-19 outbreak on the delivery of fine needle aspiration cytology (FNAC) services by our institution, a university teaching hospital. The hospital offers the full complement of specialist care including fine needle aspiration cytology, FNAC. Oral interviews of practitioners who provide this service were used to gather information for this study. Analysis of findings shows that a combination of patient factors, hospital and healthcare workers' factors and government policy all in response to the pandemic has led to a profound disruption of the fine needle aspiration cytology (FNAC) service in our hospital. With highly limited testing capacity and lack of PPE in our center, the trend is likely to persist through the pandemic. This can potentially lead to increased diagnosis of cancers with poorer prognosis in the post-COVID-19 era.

Key words: Cancer, Prognosis, COVID-19, Pandemic, Fine needle aspiration cytology.

INTRODUCTION

The novel corona virus disease (COVID-19) widely believed to have started in Wuhan China first came to global attention in January 2020¹ though before then an alarm has been raised about a non-specific pneumonia disease in the area. The World Health Organization (WHO) declared the disease a Public Health Emergency of International Concern on January 30, 2020 and a pandemic on March 11, 2020.² COVID-19 is a highly

infectious disease.^{3,4} Sanche *et al*⁴ using a model have calculated a median reproduction number, R_0 , i.e. the average number of new infections generated by one infected person, for the infection to be 5.7. The significance of this is that each infected person can transmit the infection to an average 6 new persons. With its high infectivity and non-availability of treatment and vaccine against it, the disease has put tremendous strain on global healthcare delivery systems in a form and magnitude that was unknown to humanity in this century.

As of Nov 1, 2020, there were about 46 million confirmed cases and 1.2 million deaths globally with Africa having 1, 324, 258 confirmed cases and 29, 785 deaths.⁵ As of November 4, 2020, Nigeria had 63,173 confirmed cases and 1, 151 deaths.⁶ Various containment measures have been advocated and adopted globally including restriction of movement of people and scaling down of the available care in hospitals.^{4,7} These containment measures and fear of the virus with associative factors have also brought with them unintended secondary consequences. For instance, patients with other illnesses than COVID-19 have become unable and/or unwilling to access hospital care for their non-COVID conditions for fear that they may contact the virus in the hospital. The purpose of this study is to assess the impact of COVID-19 outbreak on the delivery of fine needle aspiration cytology (FNAC) services by our institution to people who need it.

MATERIALS AND METHODS

This work involved use of oral interviews and qualitative content analysis. Three general surgeons, one pathologist and two medical laboratory scientists were separately interviewed by the author using open-ended questions based on semi-structured questions as guide. The interviewees are coded GS (General Surgeon), P (Pathologist) and LS (Laboratory Scientist) and identified as GS1, GS2, GS3, P1, LS1 and LS2. These persons were chosen because hitherto, they were those mostly involved in FNAC services in our hospital. The interview explored the participants' perception of the COVID-19 pandemic relative to the containment measures that have been put in place and the impact of these measures on FNAC services in our center. The interviews were audio recorded whilst the interviewer also took notes during the interview. The recordings were transcribed with participants de-identified for confidentiality. Reasons given by participants for the stoppage of FNAC services in our center were extracted and thematically analyzed and then grouped into hospital factors and patient factors. The setting for this work is a state university teaching hospital in Nigeria. The state has a population of about 4

million people according to 2016 estimates. The hospital receives patients from all over the state and from some neighbouring states as well. It has a full complement of surgical specialties and a well staffed histopathology laboratory though it does not receive as much funding as teaching hospitals owned and operated by the federal government. In our practice, in-house surgeons and doctors from surrounding hospitals refer patients requiring fine needle aspiration cytology to the pathologists who then carry out the procedure. Occasionally, a surgeon may take the sample by himself and send same to the pathology laboratory for processing and reporting. Due to the COVID-19 pandemic, service delivery in our teaching hospital was scaled down so that elective procedures including FNAC have been suspended. This decision taken to protect both patients and healthcare workers is due to limited supply of personal protective equipment (PPE) in the centre.

Ethical clearance was obtained from the Ethical committee of our hospital. Informed consent was obtained from participants.

RESULTS

Between January 30, 2020 when the WHO declared the disease a Public Health Emergency of International Concern and the time of this report, only 1 request for FNAC. This is less than 1% of the request for the procedure in equivalent periods in previous years. Participants included healthcare workers whose primary duties in the hospital include provision of FNAC services to patients. Patient's perspectives were represented by the surgeons. All the participants expressed different degree of reluctance to interact with patients while the surgeons and pathologist and 1 of the scientists agree that scaling down of services offered in the hospital was justified. The reasons offered in both cases include paucity of personal protective equipment and lack of insurance for health workers. Two of the surgeons, the pathologist and the 2 laboratory scientists reported that patient's concerns included fear of contracting the virus e.t.c. The reasons

given for this trend were analyzed and grouped as follows:

1. Hospital factors:
 - i. reluctance of health workers to offer certain services due to paucity of personal protective equipment
 - ii. scaling down of hospital services/re-distribution of available facilities including spaces
2. Patients' factors:
 - i. unwillingness of patients to visit hospitals for fear of contracting the virus
 - ii. patients' inability to access hospital care due to lockdown of the population

DISCUSSION

FNAC is a quick, inexpensive and cost effective method of diagnosing tumours especially those in superficial parts of the body namely breast, thyroid, salivary glands, lymph nodes etc accepted as a standard diagnostic procedure.⁸ It can also be performed on tumours affecting deep seating organs under imaging guidance.⁹ The material obtained is usually stained by routine Papanicolaou or Romanowsky staining methods for routine epithelial and stromal diseases; also for special staining methods for certain special substances or infections glycogen and fungi, and for immunohistochemistry, cytogenetic and other specialized studies.^{10,11} In addition to its diagnostic use, FNAC can also guide the surgeon in determining the scope of surgical treatment for a particular patient as well as the need for and type of non-surgical therapy to be adopted.¹⁰ Another advantage of FNAC is that it removes the burden of anaesthesia and surgery in most benign conditions and disseminated cancers on a patient¹² and shortens the period of waiting for laboratory diagnosis and accompanying uncertainty with the associated anxiety associated with surgical biopsies.

Perception of lockdown as part of government's containment measures

The participants' perception of government's population lockdown varies on a number of fronts however they are all agreed that a certain degree of restricting people's movement was needed to contain the virus. Any lockdown

restraining people's access to the hospital in any form was not acceptable to some. Some believe that the lack of PPE in hospitals makes restriction of access necessary but they argue that well built infection disease centers ought to be provided. Participants are agreed on the point that the lockdown is poorly managed as it concerns access to healthcare services. According to one of the participants:

It is a good idea on paper to lockdown the people. But the place is not good for it. If the patient can call his hospital and say this and this is wrong with me and get help, ok. But that is not possible today. So when you stop everybody from coming to the hospital with all the self-medication we know, all the quacks here and there...we shall take whatever we see after now. [Gs2]

General scaling down of hospital services/re-distribution of available hospital materials and facilities

The pandemic has led to scaling down of healthcare services in our environment due to paucity of vital personal protective equipment (PPE) for healthcare workers including doctors. As such available resources are channeled towards severe and life-threatening conditions and emergencies. Surgeons therefore are not keen on referring patients for FNAC procedure. They point to pathologists and laboratory staff who for lack of PPE are unwilling to continue carrying out FNAC procedures. In addition to lack of adequate PPE, surgeons also point out that there is no benefit making a diagnosis of cancer during the pandemic since no definite treatment may be instituted for such a patient at present. They argue that with the prevalent view of cancer in our environment being that of hopelessness, making a diagnosis of cancer without instituting a care will worsen the mental agony and by extension prognosis. According to the pathologist:

What will be the use of making a diagnosis of cancer in a patient when there will be no immediate intervention. You will just be creating more problems. [P1]

A laboratory scientist contextualized it:

The people believe that cancer is equal to death. If you say, Oh, you have cancer but go home; nothing we can do now.

They will go home. When they die, they will say, "He would never have died if that doctor did not say that he has cancer." [LS2]

Reluctance of health workers to offer certain services due to paucity of personal protective equipment (PPE)

The participants believe that since the FNAC procedure entails that the persons performing the procedure must come into very close proximity to the patient especially for tumours around the upper part of the body e.g. thyroid mass or cervical lymph node and even breast masses, it is a high-risk procedure in the face of COVID-19 pandemic. For superficial tumours, the procedure involves adequately swabbing the appropriate surface of a tumour with alcohol-soaked gauze after which a narrow bore needle (21G, 23G or 25G) mounted on a 10ml or 20ml syringe is used to pulverize a circumscribed portion of the tumour while it is steadied with one hand. Thereafter the pulverized tissue is aspirated with the needle for onward smearing onto clean, dry glass slides. These require that the doctor be close enough to a patient that they could breathe the patient's expired air. This obviates social distancing prescribed as one of the few ways of protection against the virus. In addition to expired air, the doctor performing FNAC is at the risk of exposure to the aerosols that could be produced by a patient following sneezing and coughing any of which could occur during an FNAC procedure. One surgeon put it this way:

The high rate of infectivity of the novel corona virus makes the slightest hint of deliberate exposure to it very fearful, a reckless action. If anything bad happens to me or the patient, there will be blames. The risk is there. [GS2]

This fear is worsened by the background knowledge that in its present state, our healthcare system cannot optimally care for more than a few symptomatic COVID-19 cases. Additionally, there is also no vaccine for the disease as yet albeit that many therapies and a number of vaccines are being tried. Healthcare workers including doctors therefore are opting for minimized contacts with patients as much as is ethically possible. In the words of the pathologists:

I want to care for these patients. It is my work. But if I can't be protected against them, if I can't protect them ... from this virus, what is the use of endangering any life over something that can wait. [P1]

Patients' reluctance to access service for fear of contracting the virus

Some surgeons reported that patients who were offered the FNAC procedure opted not to access it until the pandemic is over. It seems that the current view of the population is that hospitals could be unsafe for people who are not critically ill. One surgeon stated:

An old patient of mine said during her last clinic visit that she was not sure she will come to the clinic again until the pandemic ends. She said that it is better to stay at home and watch things than to come to the clinic to worry about who is covering nose and who is not covering. [GS1]

Before the pandemic, FNAC is a fairly well utilized diagnostic procedure in our hospital with the most requests, expectedly, coming from the general surgery subspecialty.¹⁵ This subspecialty is also the busiest of the surgical specialties in our hospital. However, from 30th January 2020 when the WHO declared that COVID-19 a Public Health Emergency of International Concern² to the time of this report, our department has received only 1 request for FNAC procedure and provided same. This is in spite of the fact that our hospital has remained open and so has our laboratory in the same period though with services rendered are scaled down.

Patients' inability to access hospital care due to lockdown of the population

Among the containment measures adopted in our country is lockdown of the population including closure of interstate borders. There is a noticeable misunderstanding among the community about the operations of the lockdown and as such many people are not accessing tertiary care in the lockdown period. According to one participant:

The details of the lockdown appear unclear to the people. Essential services including healthcare are not affected. But if you can't find transport to go to the hospital, how can

you go there? [GS1]

This may have affected the number of people that may have wanted to access the FNAC service. Also the supply of laboratory reagents has been affected. According to one of the laboratory scientists:

We are almost out of reagents. The suppliers cannot supply because the market is closed. If we continue to get requests for FNAC, we may be unable to process. [Ls1]

Implications of the disruption of FNAC services

Similar disruptions of healthcare services with associated responses of healthcare workers and the populace and the different outcomes have been reported from various parts of the world.¹⁴⁻¹⁸ The implication of this pandemic-induced disruption of FNAC service is the loss of an opportunity for simple, quick and cheap means of diagnosing and therefore commencing treatment for an important disease like cancer. Consequently, depending on individual tumour doubling time, the stage and therefore prognosis of cancers that could have been diagnosed earlier may worsen especially if the pandemic protracts and the current trend of disruption of FNAC service continues. The potential implication of this is that there may be an increase in cancers with worsened prognosis after the COVID-19 pandemic. In the words of the pathologists:

It is a scientific possibility. If the pandemic lingers, if the present attitude to a procedure like FNAC does not get better, we may get a few cancers after now whose features may have worsened because of the delay. We may never know. [P1]

Another potential consequence is that people with undiagnosed cancer may not take an all-important extra precaution against the virus. The importance of this is underscored by the evidence that cancers and a number of other underlying health conditions predispose to or worsen the outcome of COVID-19.^{19,20} One of the surgeons put it succinctly:

This is one time that ignorance certainly will not protect anyone. Knowledge that "I have an underlying condition like cancer" will make many people take extra precaution against the virus [GS2]

A third consequence of the disruption of FNAC service is

the loss of revenue that would have accrued to the hospital from such services. The impact of this loss will become more glaring against the background that the full compliments of staff that should have provided the service is still being paid their monthly salaries.

CONCLUSION

COVID-19 pandemic has caused multifaceted and major disruption in healthcare services globally including in our own center with presently known and yet to be discovered adverse health consequences. With highly limited testing capacity and lack of PPE in our center, the present disruption is likely to persist for as long as the pandemic lasts. This may result in an increase in cancer-related deaths after the pandemic. To mitigate this, a triage system should be created to select patients who need FNAC but are not likely to have the virus so the service can be offered to them. A special action plan for cancer care from diagnosis (by FNAC) to treatment should be created for the pandemic period such that treatment can be activated for a patient when a diagnosis of malignancy is made. For an FNAC procedure, healthcare workers and patients should closely adhere to minimum World Health Organization's (WHO) recommendations for personal infection prevention and control namely hand washing with soap and water, use of alcohol-based hand sanitizers and wearing of protective mask during the procedure. Hospital management should therefore prioritize provision of all necessary facilities. Proper management of government containment efforts including improved public enlightenment is necessary to avoid unintended secondary consequences of the pandemic. Continued medical education (CME) programmes should be routinely organized for healthcare workers to help improve knowledge about COVID-19 especially as knowledge about the disease expands.

Author's contributions

SRO conceptualized and carried out the work; drafted and edited the manuscript.

Conflict of interest

The author declares no competing interest.

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