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RESEARCH ARTICLE

Epidemiological and Clinical Report of Patients during the First Wave of COVID-19 in Gambella Region, South West Ethiopia: 2020. A Retrospective Cohort Study

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Abstract

Background: Covid-19 has continued to cause all round devastation globally, including our country, Ethiopia. To halt the spread, knowing the epidemiological, laboratory, and clinical characteristics of patients is significant. Therefore, we presented the epidemiological and clinical findings.

Method and materials: A retrospective cohort study design was employed among residents in the Gambella region, Southwest Ethiopia. We retrieved data from the patient's data registry obtained from hospitals, quarantine, and isolation centers in which data confirmed of COVID-19 from 5-Jun-2020 to 13 August 2020 were included in the study using a standardized data collection form. Then, entered into Epidata version 3.1 and exported to SPSS version 22 for analysis.

Result: A total of 667 Covid-19 confirmed patients were included into this study. The mean age of the study participants was 29.54 (SD = 12.63) and the majority of participants the majority lie in the ages between 21-40 years. More than half were male participants and 79.3% of the zonal distribution was from Gambella town in which the majority of confirmed cases were obtained from Gambella General Hospital and Gambella Primary Hospital. From the epidemiological features, about 10.5% of the cases had travel history and 34.5% of the cases had contact history. The majority of samples were tested and confirmed from suspected cases.

Conclusion: In this study, most patients were at a younger age and male participants. Most of the sample was obtained from hospitals found in Gambella town. Cases have reported travel history and over one-third experienced contact history. Most patients were suspected, and very few numbers of patients developed signs and symptoms. Therefore, a cooperated and coordinated effort is highly expected focusing on younger age, males, with more emphasis on the Gambella town because of a high transaction of people. Health professionals should strictly follow the preventive measures while serving patients.

Keywords

Epidemiological, Clinical characteristics, COVID-19, A retrospective cohort study

Abbreviations

ARDS: Acute Respiratory Tract Infection; COVID-19: Coronavirus Disease 2019; EPHI: Ethiopian Public Health Institute; GW: General Ward; HEWs: Health Extension Workers; ICU: Inpatient Care Unit; Km: Kilometers; M: Meter; MOH: Ministry of Health; NGOs: Non-Government Organizations; SARS-CoV-2: Severe Acute Respiratory Infections-Cov-19; SD: Standard Deviation; SPSS: Statistical Package for Social Science; WHO: World Health Organization

Introduction

Coronavirus disease 2019 (COVID-19) is a respiratory tract infection caused by a newly emergent coronavirus, SARS-CoV-2. After it was announced as outbreak of a Public Health Emergency of International Concern, Covid-19 has continued to affect all age groups and countries globally [1]. With an epidemiological

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association to the Huanan Seafood Wholesale Market of animal origin [2], it shows symptoms with influenza infections that lead to the concerning community spread and severity [3].

Different variety of COVID-19 species has been reported that makes it difficult to develop vaccines and easily halt the spread [3]. Though rigorous global containment and efforts have been made, it caused huge number of morbidity and mortality globally [4-6]. In Africa, the first COVID-19 case was reported from Egypt on February 14, 2020 [7]. Since then, it has affected African countries, reporting 1,736,499 confirmed cases, 41,791 deaths, and 1,423,342 recoveries in the continent. Most were from Southern African and Northern Africa. In Ethiopia, after the first reported of coronavirus case, it reached 94,218 confirmed cases and 1445 deaths [5,6]. People with COVID-19 experience a wide range of symptoms reported ranging from mild symptoms to severe illness [8]. It is transmitted through the droplet, direct and indirect contact, and aerosol in long-range transmission [6,9,10].

Till now, COVID-19 has no well recognized and approved effective cure, yet early recognition of symptoms and timely seeking of supportive care and preventive practices enhance recovery from the illness and combat the spread of the virus [11,12]. It aims to slow and stop transmission, prevent outbreaks and delay spread; provide optimized care for all patients [13]. A study from China has identified that Health-care providers volunteered and tried their best to provide care for patients [14]. Findings from Afganistan, among nurses,' highlighted areas of concern and scheme of improvement in the effective management of the COVID-19 [15]. Even if most HCWs used social media to get the information (61%), a significant proportion of HCWs had poor knowledge of its transmission (61%), and symptoms onset (63.6%) [16]. A study done in Ethiopia identified that the status of knowledge and desirable practices did not combat this rapidly spreading virus [11].

Several studies have been conducted on the epidemiological and clinical characteristics of COVID-19 [17-19]. A study from South Korea has reported that one-fifth of patients remained asymptomatic [17]. Similarly, the study in India identified that they observed the infection in both adolescents and the elderly with a predominance of young adults. The majority (61.9%) of patients had a history of international travel, most frequently to Italy. However, none reported a travel history to China. Almost half (42.9%) of patients were asymptomatic infection [20].

Per the knowledge of the researchers, none has been published so far, in Ethiopia particularly, in the South-West part of the country with a large sample on the epidemiological and clinical characteristics of COVID-19 confirmed patients. Knowing patients clinical feature help set priority and design of effective and consistent measures of COVID-19 with the need to have its own packages of implementation. Thus, this study described the epidemiological and clinical characteristics of COVID-19 among residents of the Gambella region, South West Ethiopia: 2020.

Methods and Materials

Study area and period

We conducted the study in the Gambella region, Southwest Ethiopia which is about 766 km away from the capital city of Addis Ababa. The region has a total population of 396,000 [21]. The region has 4 public district hospitals with one general hospital. The COVID-19 quarantine and isolation centers were established at each zonal health institution along with other temporary settings, including schools. Health professionals were recruited and provided service at each center under the control of the Gambella regional health bureau COVID-19 prevention and control task force. Covid-19 confirmed data were obtained from the patient's data registry which was confirmed from January-2020- August-20, 2020 were included into the study. We extracted data during August 2020.

Study design

We employed a retrospective cohort study.

Inclusion criteria

All positive tests during the study period were included.

Sample size determination and sampling

A retrospective review of 667 patients with laboratory-confirmed COVID-19 cases from all centers of the Gambella region was included in the study between 5-Jun-20 to 13 August-2020.

Data collection procedure and instrument

We extracted demographic, epidemiological, and clinical data from the patient electronic medical registry of all patients with laboratory-confirmed SARS-CoV-2 infection. Two data collectors independently gathered all data using a standardized data collection form. The each data were checked for clarity and completeness by the principal investigator before data analysis.

Data processing and analysis

Collected data was first checked manually for completeness and consistency. Then, it was entered into Epi Data version 3.1 and exported it to SPSS version 22 for analysis. Descriptive statistics were done for socio-demographic characteristics, epidemiological and clinical variables, and put in terms of mean with standard deviations and range values for numerical data as opposed to percentage and frequency tables for categorical data.

Data quality management

Data collectors were given trainings to collect the data. The principal investigator checked the completeness, accuracy, and consistency of the collected data. Data editing/coding and entry was made into the computer. Then, computer data cleaning was taken place to check for the consistency of data.

Conditions/terminologies definitions

Cases were defined based on the WHO's and/or national guideline as follows:

- **Suspected COVID-19 case**- Any person presenting with an acute onset of fever AND cough; or any other or more of the following signs or symptoms: Fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnoea, anorexia/nausea/vomiting and diarrhea.
- **Close contact**- Face-to-face contact within 2m for more than 15 min OR direct physical contact with a confirmed COVID-19 case within 14 days of symptom onset or positive test 2021
- **First-generation cases**- Those with a clear history of recent international travel and assumed to be imported cases
- **Second generation cases**- Those with a clear history of contact with first-generation or confirmed cases
- **Third-generation cases**- Cases with neither clear history of neither contact nor recent travel
- **Asymptomatic COVID-19**- No reported symptom by the patient PLUS normal findings on initial physical examination
- **Mild COVID-19**- Uncomplicated upper respiratory tract infections
- **Moderate COVID**-19- Mild pneumonia not needing supplemental oxygen or breathing difficulty 21
- **Severe COVID-19**- Severe pneumonia OR acute respiratory distress syndrome
- **Critical**- Any of the following conditions: Respiratory failure, septic shock, multiple organ dysfunctions or failure and need for invasive or special management.

Result

Socio-demographic characteristics of COVID-19 infected patients

A total of 667 Covid-19 positive patients were

Table 1: Socio-demographic characteristics of Covid-19 infected participants in Gambella Region, South-West Ethiopia, 2020.

Variable		Frequency total (667)	%
Age	(Mean -SD)	29.54 SD ± 12.637	667
	<= 20 years	163	24.4
	21-40 years	408	61.2
	41-60 years	80	12.0
	>= 61 years	16	2.4
Sex	Male	384	(57.6)
	Female	283	(42.4)
Zonal distribution	Agnwa	18	2.7
	Gambella Town	529	79.3
	Itang special	14	2.1
	Majang	36	5.4
	Nuwer	70	10.5
Sample collection areas	NGOs	20	2.99
	Gambella General Hospital	243	36.43
	Gambella Primary Hospital and Gambella town	207	31.03
	Gambella university quarantine and isolation center	74	11.09
	Other health institutions	9	1.34
	Metti Health Center	36	5.39
	Pagag	66	9.89
	Pugnido Isolation center	5	0.74

NGOs - Action Against Hunger regional office, ADRA, DRC, Humanity and inclusion office, Ngunyieel Refugee Camp, Pugnido ARRA.

Other health institutions- Kumi Primary Hospital, Kule Health Center, Itang Health Center, Dimma Health center.

included in this study. The mean age of participants was 29.54 ± 12.63 (SD) and 61.2% of them lie in the age groups between 21-40 years of age. The majority of study participants were male in sex category and 529 (79.3%) of participants zonal distribution was from Gambella town. Regarding the sample collection areas, 243 (36.43%) and 207 (31.03%) were obtained from Gambella General Hospital and Gambella Primary Hospital, and Gambella town, respectively. Similarly, 20 cases were obtained from Non-Government Organizations that were working in different humanitarian activist for refugees (Table 1).

Epidemiologic and clinical characteristics of COVID-19 infected patients

This study has found out that 70 (10.5%) of the cases had travel history, in which most of them 69 (10.35%) were from South Sudan. The study verified that 230 (34.5%) of the cases had contact history. Concerning reasons for testing, about 41.1% were suspected whereas 233 (34.9%) and 129 (19.3%) were found confirmed from among the contact and high-risk groups. However, a few numbers of cases were obtained from dead body and discharged from quarantined settings.

Few number of patients 13 (2.10%) from the cases reported that they developed signs and symptoms who were admitted in the quarantine settings of the region. Similarly, 381 (57.1%) of participants' body temperature was recorded <= 37.00 °C. Finally, 25 (3.75%) of the study participants were health care professionals.

Discussion

After the report of the first case in Ethiopia, the government in collaboration with responsible bodies has been strictly implementing Covid-19 prevention and control measures. Despite that effort, the number of infected patients increases with limited capacity and access to services. Gambella is one of the regional states which were among the settings under such program.

This study reported a total of 667 Covid-19 confirmed patients who were under follow up in different health care setting including quarantine places. The mean age of study participants was 29.54 ± 12.63 (SD). This study found that the majority were in between ages 20-40 years of age. This shows consistent findings with a study conducted in Africa [19], and in contrast to a study done in Wuhan China with larger average age of the patients as compared to ours [22]. As it is known, Ethiopia has a large proportion of younger age groups who are more likely to defend the infection due to having intact immunity. There was a higher number of male

Table 2: Epidemiologic and clinical characteristics of COVID-19 infected participants in Gambella Region, Sowth-West Ethiopia, 2020.

Travel history	**Yes**	**70**	**10.5**
	No	597	89.5
Source of travel history	South Sudan	69	10.35
	Kenya	1	0.15
	No	597	89.5
Contact history	Yes	230	34.5
	No	437	65.5
Reason for testing	Contact	233	34.9
	Dead Body	2	0.3
	Discharge from Quarantine	6	0.9
	High Risk Group	129	19.3
	Not filled	8	1.2
	SARI/Pneumonia/Surveillance	15	2.2
	Suspect	274	41.1
Symptom developed	Yes	13	2.10
	No	653	97.9
Body temperature	<= 37.00	381	57.1
	37.01-38.00	282	42.3
	38.01-39.00	4	0.5
History of admission	Yes	2	0.3
	No	665	99.7
Health worker	Yes	25	3.75
	No	642	96.25

participants with about 57.6% of the proportion that shows consistency with findings conducted elsewhere [10,18,19] and against studies conducted in different settings of China [23,24].

Concerning the epidemiologic and clinical characteristics, 70 (10.5%) of the cases had a travel history of whom the majority were from South Sudan. They have reported travel history as a risk factor for the spread of Covid-19 that is in line with WHO guidelines [1,3]. Despite the differences in the characteristics and dynamics of the disease nature, several studies have found that a person with travel and contact history was significantly associated with Covid-19 infection [20,22,24,25]. A study from Wuhan China verified that 49 (49%) of patients had a history of exposure to the Huanan seafood market [22], and Eleven (52.4%) patients had a history of contact with a lab-confirmed COVID-19 patient [20]. Whereas, more than half of the patients, 13 (61.9%), had a travel history outside India. Most patients 8 (38.1%) visited Italy, followed by 2 (9.5%) who traveled to London, and other 3 patients (4.8%) who had been to Iran, Saudi Arabia, and Malaysia, respectively [20]. In contrast to previous reports, most patients (24/26) had not been in close contact with individuals from Wuhan. Similarly, 11 patients or their family members worked at the same supermarket [24,25].

Because of the earlier cases, WHO recommends that all patients with suspected COVID-19 infection who have severe acute respiratory infection be triaged at the first point of contact with the healthcare system and that emergency treatment should be started based on disease severity [26]. In the case of testing, the majority about 41.1% were suspected whereas the rest 233(34.9%), and 129 (19.3%) were from Contact and High-Risk Groups. However, 292 (77%) were detected through symptom-based surveillance. Household contacts and those traveling with a case were at higher risk of infection. Isolation and contact tracing reduces the time during which cases are infectious in the community, reducing the risk [25]. Very few cases were also obtained from dead body which is lower than the study from Shenzhen, China [25].

This study showed a much lower level of signs and symptoms of covid-19 infection as compared to other studies [1,17,20,24]. The majority were asymptomatic in which their body temperature was recorded below 37.00 °C which did not show significant changes to affect the body of patients. For those presenting with mild illness, it may not require hospitalization unless there is concern about rapid deterioration which may consider the provision of care at home [26]. Unlike to our study, asymptomatic patients with comorbid illnesses may be prove to severity that needs critical care for COVID-19 [23]. The likely explanation behind the low severity of the disease might be due to the fact that large numbers of study participants were at younger age group involved with intact immune system. On the other hand, a recent study conducted in Ethiopia found that the likely hood of being sever in Border areas like Gambella region is low. However, it's at high risk of contracting infection due to the high transaction of people by the entry points of the country [27].

Finally, our study found that 25 (3.75%) of health care professionals were infected for Covid-19. This showed consistent findings with studies done in Southern Italy and South of the Netherlands in which 3.4%, 5% of study participants were health care professional respectively [28,29]. As evidenced by the study conducted in China, These health care professionals might have been exposed to touching their check, mouse, and nose were associated with COVID-19 infection among health workers [30].

Conclusion

The study found that the majority of study participants were at the younger age and male in sex category. The larger number of the sample was obtained from hospitals found in Gambella town. Of the epidemiological features, cases had reported travel history and contact history. Regarding the reason for testing, patients were suspected, having had contact, and being high-risk groups. Very few numbers of patients developed signs and symptoms. Finally, health care professionals were also infected with COVID-19.

Therefore, cooperative efforts should be exerted to halt the spread of Covid-19 by all responsible bodies with particular focus on younger age, males, and attendees at GGH, GPH and Gambella town residents where there are high flow and transaction of people. Awareness creation should be continued to advance knowledge and attitudinal gaps. Health professionals should strictly follow the preventive measures while giving services for patients.

Strengths and limitations

This study is the first comprehensive report on COVID-19 from Gambella, Ethiopia. The epidemiological and clinical profiles of cases have been presented. However, there are some limitations worth mentioning here. We did not include the clinical course during follow-up in this report as the surveillance database included only clinical status at diagnosis and discharge outcomes. Hence, patients who were asymptomatic during the initial diagnosis might have developed symptoms and severe disease later. As stated above, it is also highly likely that mild and non-specific symptoms might have been ignored by both the patients and the healthcare provider that could have underestimated the number of symptomatic cases. On the other hand, the reported CFR is likely to be inaccurate due to (1) The case definition used by the country for COVID-19-related deaths was non-selective and (2) Many COVID-

19-related deaths might have been missed due to poor surveillance system.

Declarations

Ethical issues

Ethical Clearance was obtained from Gambella Teachers Education and Health Science College Research Ethics Review Committee. We granted permission to collect data from Gambella regional health bureau. All data would be kept confidential by using codes to identify participants instead of names or any other personal identifiers.

Consent for publication

Not applicable.

Availability of data and materials

The data sets used and/or analyzed during the current study are all included into the current study.

Competing interests

The authors declare that they do not have a competing interest.

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Author contributions

AA: Involved in the inception, design, data acquisition, analysis, and interpretation, and wrote the manuscript. **EZ, TT, and TG were involved in the** data acquisition, analysis, and involved in critical reviewing of the manuscript. Finally, all authors read and approved the manuscript.

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