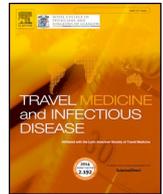




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Preliminary epidemiological analysis of suspected cases of corona virus infection in Libya



Dear Editor,

Since December 2019, Corona Virus Disease (COVID-19), a new emerging infectious disease occurred in Wuhan, has spread all over the world and WHO has declared that the infection is “Pandemic” and No country and region can be considered safe [1]. Despite that all measures has been taken and clearly illustrated by WHO and CDC such measure can not be easily applied and followed within the conflict areas in the world such as Syria, Yemen and Libya which suffers mostly [2]. Libya has been hampered by a major armed conflict since 2011. The country is divided and two counterattack governments were founded. This has been clearly reflected on the quality of health services all over the country and citizens suffer immensely to get the basic and emergency services [3]. Influx of immigrants and fighting Militias form all over the world has added extra burdens of traceability and control of emerging infectious diseases in the country [4]. Few studies were carried on the impact of immigrants and military fighting on spread of infectious diseases in Libya. In 2014, an outbreak of viral hemorrhagic fever composed twenty-three cases were reported in North West Libya that goes in concordance with those occurred in West- Africa [5]. Here in we would like to report on the first suspected cases of corona virus infection in Libya. Eight patients arrived from different countries where corona virus infection was officially reported and critically spread including Egypt (4), Tunis (2), Saudi Arabia [1] and Italy [1]. The epidemiological, demographic, clinical and laboratory data, where collected for each patient by direct communications with attending doctors and other healthcare providers.

The median age of the suspected cases was 56 years and 6 (75%) of them were men. On admission, most patients had fever and/or dry cough. Other different symptoms were also reported including chest pain, headache, confusion, diarrhea and constant pain as illustrated in Table 1. Different hematological and biochemical marker were reported (Table 1) including lymphopenia occurred in 6 patients (75%), and elevated lactate dehydrogenase in 6 patients (75). Platelets were below the normal range in 6 (75%) patients and above the normal range in two (25%) patients. Patients also had differing degrees of liver function abnormality, with alanine aminotransferase (ALT) or aspartate aminotransferase (AST) above the normal range. No other respiratory viruses in any of the patients were reported neither a significant bacteria determined. According to chest x-ray and CT, 6 (75%) patients showed bilateral pneumonia with just 3 (38%) patients showing unilateral pneumonia. Two (25) patients showed multiple mottling and ground glass opacity. All patients were treated in isolation and received antiviral, antimicrobial and supportive treatment according to the International standards [1]. By March 14, 3 (38%) patients had been discharged and 2 (25%) patients had died; all other patients were still in hospital. Despite the several limitations of this preliminary descriptive study has, it highlights the major concern and the consequences of the spread of this vital infection not only in Libya but also southern European countries as most of immigrants come via Libyan Mediterranean shores. As this unstable situation in Libya continues, this will make the country at a highest vulnerable condition. Hence then international efforts should be combined to encompass this pandemic.

Table 1
Demographics, clinical and diagnostic characteristics of Libyan patients with suspected corona virus (2019-nCoV) pneumonia.

Patients Characteristics	Patients (no = 8)
A-Demographic Parameters	
Age period	
40-59	5 (63%)
≥ 60	3 (38%)
Gender	
Male	6 (75%)
Female	2 (25%)
Occupation	
Employee	5 (63%)
Retired	3 (38%)
B-Clinical signs & symptoms during admission	
Fever	7 (88%)
Fatigue	6 (75%)
Dry cough	6 (75%)
Headache	3 (38%)
Chest pain	3 (38%)
Nausea & Vomiting	2 (25%)
Diarrhea	1 (13%)
Combines signs & symptoms	8 (100%)
C-Radiology parameters (X-ray& CT)	
Bilateral pneumonia	6 (75%)
Unilateral pneumonia	3 (38%)
Multiple mottling	2 (25%)
D-Hematology Markers	
White blood cells (× 10 ⁹ per L; normal range 3· 5–9· 5)	
Increased	7 (88%)
Neutrophils (× 10 ⁹ per L; normal range 1· 8–6· 3)	
Increased	8 (100%)
Lymphocytes (× 10 ⁹ per L; normal range 1·1–3·2)	
Decreased	6 (75%)
Platelets (× 10 ⁹ per L; normal range 125·0–350·0)	
Increased	2 (25%)
Decreased	6 (75%)
Haemoglobin (g/L; normal range 130· 0–175· 0)	
Decreased	6 (75%)
E-Biochemistry Markers	
Total bilirubin (μmol/L; normal range 0·0–21)	
Increased	2 (25%)
Albumin (g/L; normal range 40·0–55·0)	
Decreased	7 (88%)
Blood urea nitrogen (mmol/L; normal range 3·6–9·5)	
Increased	2 (25%)
Decreased	4 (50%)
Alanine aminotransferase (U/L; normal range 9·0–50·0)	
Increased	2 (25%)
Serum creatinine (μmol/L; normal range 57·0–111·0)	
Increased	1 (13%)
Decreased	2 (25%)
Aspartate aminotransferase (U/L; normal range 15·0–40·0)	
Increased	3 (38%)
Lactate dehydrogenase (U/L; normal range 120·0–250·0)	
Increased	6 (75%)
Glucose (mmol/L; normal range 3·9–6·1)	
Increased	6 (75%)
Decreased	1 (13%)
Creatine kinase (U/L; normal range 50·0–310·0)	
Increased	1 (13%)
Decreased	3 (38%)

Funding source

No source of funding.

Declaration of competing interests

The author has no conflict of interest to disclosure.

References

- [1] Xu XW, Wu XX, Jiang XG, Xu KJ, Ying LJ, Ma CL, Li SB, Wang HY, Zhang S, Gao HN, Sheng JF. Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. *BMJ* 2020 Feb 19:368.
- [2] Daw MA, El-Bouzedi AH, Dau AA. Trends and patterns of deaths, injuries and intentional disabilities within the Libyan armed conflict: 2012-2017. *PLoS One* 2019;14(5).
- [3] Daw MA. Libyan healthcare system during the armed conflict: challenges and restoration. *Afr. J. Emerg. Med.* 2017 Jun;7(2):47.
- [4] Daw MA, El-Bouzedi A, Ahmed MO, Dau AA, Agnan MM. Epidemiology of hepatitis C virus and genotype distribution in immigrants crossing to Europe from North and sub-Saharan Africa. *Trav Med Infect Dis* 2016 Sep 1;14(5):517–26.
- [5] Daw MA, El-Bouzedi A. Viral haemorrhagic fever in North Africa; an evolving emergency. *J Clin Exp Pathol* 2015;5(215). 2161-0681.

Mohamed A. Daw

*Professor of Clinical Epidemiology & Acting Physician of Internal Medicine,
Department of Medical Microbiology & Immunology, Faculty of Medicine,
University of Tripoli, Tripoli, Libya
E-mail address: mohamedadaw@gmail.com.*