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Unusual Presentation of Coronavirus Disease, Survey Study

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Keywords

Coronavirus disease, Mysteries of disease, neurological symptoms.

Abstract

This work was designed to highlight some of the mysteries of the disease, especially neurological symptoms. A retrospective clinicoepidemiological study was conducted on a randomized sample of 201 patients in the Kurdistan region in northern Iraq of both genders and different age groups affected with coronavirus disease. The signs and symptoms of the disease were recorded by the patients themselves through a self-report questionnaire designed to put the age, gender, symptoms, and severity of symptoms. The data collected were processed and analyzed statistically by a professional statistician using SPSS program version 23, three methods were used for estimating the correlation between the disease and each symptom as well as between the symptoms themselves. The distribution of symptoms according to age group and gender were also estimated. Each case was dealt with separately according to its own merits. The most common symptom observed in this study was fever 75.9%, next is cough 43.9%, malaise 38.9%, headache 38.4, loss of smell 36.5%, dyspnea 34%, loss of taste 32%, muscle pain 21.7%, amnesia 20.9%, loss of concentration 19.4%, dizziness 13.3%, vomiting 13.3%, tiredness 11.8%, diarrhea 9.6%, chest pain 8.7%, loss of consciousness 4.9%, throat pain 4.9%, gastric pain 1.5%, abdominal colic 1.5%, cold sensation 1.5%, running nose 0.5% and skin rash 0.5% out of the total (201).

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1. Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus, it is considered a serious health problem worldwide. Most people infected with the virus develop no symptoms others have mild to moderate symptoms, elderly people, and those with underlying medical conditions like chronic respiratory disease, cardiovascular disease, diabetes, or cancer have a higher risk to develop serious illness (Avula et al., 2020).

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The signs and symptoms of coronavirus disease 2019 may appear 2 to 14 days after exposure to the virus (Beyrouiti et al., 2020; Cecil et al., 2012; Corman et al., 2018). Early and mild symptoms of COVID-19 may include, loss of taste or smell, fever, cough, and tiredness, other symptoms can include, shortness of breath or difficulty breathing, muscle aches, joint pain, chills, sore throat, running nose, headache, chest pain, pink eye (conjunctivitis), nausea, vomiting, diarrhea, and skin rash (Chen et al., 2020; De Groot et al., 2011).

It is well known that the Corona Virus attacks mainly the respiratory system. Meanwhile, it has been established that coronavirus infection can extend beyond the respiratory system and unfortunately can also affect the nervous system (De Groot et al., 2013; Diaz-Segarra et al., 2020; Fehr & Perlma, 2015). Therefore, producing unusual neurological symptoms of the disease varying from headache, dizziness, and decreased concentration, to loss of consciousness, ischemia, stroke, and impaired memory (Forgie & Marrie, 2009; Garvin et al., 2020).

The pathophysiology of how the virus gets access to the central nervous system is via the bloodstream invading the endothelial lining cells of the blood vessels (Garvin et al., 2020; Hui et al., 2020). Also, it was reported that the virus can enter the peripheral nervous system and via retrograde axonal transport route it gets access to the central nervous system (Jain et al., 2020; Oxley et al. 2020). Also, the virus could be internalized in nerve synapses through endocytosis, transported retrogradely, and spread trans-synaptically to other brain regions (Oxley et al. 2020).

In a retrospective study performed on COVID-19 patients from Wuhan, China, neurological symptoms were observed in 36.4% of total patients and 45.5% of patients with severe infections (Jain et al., 2020). Observed symptoms of central nervous system (CNS) infection included dizziness, headache, impaired consciousness, acute cerebrovascular disease, and ataxia (Poon et al., 2011). Moreover, a large-scale study of COVID-19 patients from the United Kingdom revealed neurological disorders were frequent among the 153 “unique” cases of COVID-19 identified by physicians. Of the 125 patients with clinical data, a cerebrovascular event, defined as ischemic stroke, intracerebral hemorrhage, or central nervous system vasculitis, was observed in 62% of patients reported. An altered mental status, defined as unspecified encephalopathy, encephalitis, or psychiatric diagnosis, was observed in 31% of patients (Sacco et al., 2013).

2. Aim of the work

This work was designed to highlight some of the mysteries of the disease, especially neurological symptoms.

3. Patients and Methods

A retrospective clinicoepidemiological study was conducted on a randomized sample of 201 patients in the Kurdistan region in northern Iraq of both genders and different age groups affected with coronavirus disease. The signs and symptoms of the disease were recorded by the patients themselves through a self-report questionnaire designed to put the age, gender, symptoms, and severity of symptoms.

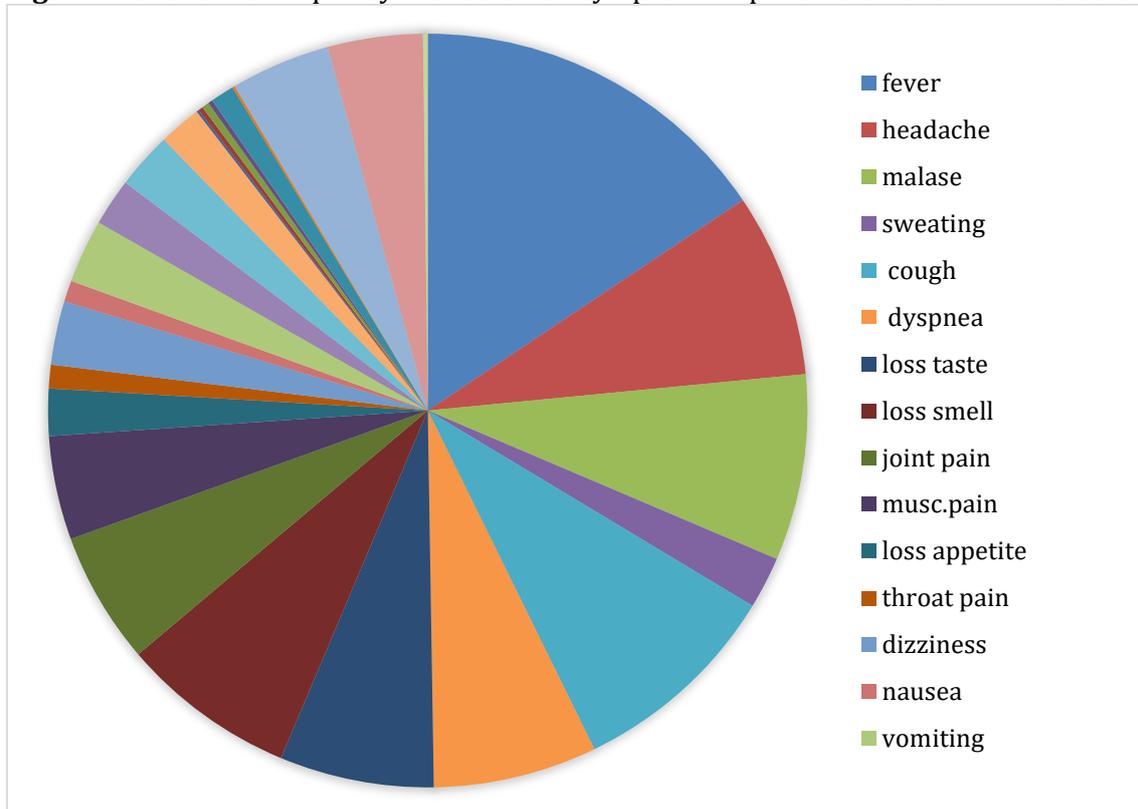
4. Statistics

The data collected were processed and analyzed statistically by a professional statistician using SPSS program version 23, three methods were used for estimating the correlation between the disease and each symptom as well as between the symptoms themselves. The distribution of symptoms according to age group and gender were also estimated.

5. Results

Each case was dealt with separately according to its own merits. The most common symptom observed in this study was fever 75.9%, next is cough 43.9%, malaise 38.9%, headache 38.4, loss of smell 36.5%, dyspnea 34%, loss of taste 32%, muscle pain 21.7%, amnesia 20.9%, loss of concentration 19.4%, dizziness 13.3%, vomiting 13.3%, tiredness 11.8%, diarrhea 9.6%, chest pain 8.7%, loss of consciousness 4.9%, throat pain 4.9%, gastric pain 1.5%, abdominal colic 1.5%, cold sensation 1.5%, running nose 0.5% and skin rash 0.5% out of the total (201).

Figure 1. Shows the frequency of the studied symptoms in patients of corona virus disease



The symptoms vary from mild, to moderate to severe. Severe symptoms specifically were observed with fever, headache, muscle and joint pain, amnesia, and loss of concentration. Crosstabulation was done for each symptom in relation to age and sex. No specific age group was found to be more affected by any of the neurological symptoms in the form of dizziness, amnesia, and loss of concentration. Regarding sex variation, no significant difference was found between females and males in relation to dizziness. Whereas, amnesia and loss of concentration were found to affect males more than females.

Table 1. Shows crosstabulation count of dizziness in both males and females.

* dizziness * age and gender Crosstabulation				
Count				
	Dizziness		Total	P-value
	Not	Low		
Male	87	15	102	P<.001
Female	87	12	99	P<.001
Total	174	27	201	

Table 2. Shows the frequency of loss of concentration in both males and females.

Loss of Concentration age and gender Crosstabulation				
Count				
Gender	loss of concentration		Total	P-value
	Not	Low		
Male	78	24	102	P<.001
Female	83	16	99	P<.01
Total	161	40	201	

Table 3: Shows crosstabulation of amnesia in male and female patients affected by coronavirus disease.

Amnesia age and gender Crosstabulation				
Count				
Gender	Amnesia		Total	P-value
	Not	Low		
Male	78	24	102	P<.001
Female	81	18	99	P<.001
Total	159	42	201	

6. Discussion

The old view was that coronavirus is a disease that affects the respiratory system and it was called “Mediterranean Respiratory Distress Syndrome” (MRDS) (Steardo, 2020). According to the author’s recent concept, coronavirus can extend beyond the respiratory system into many systems of the body including most importantly the nervous system (Wang et al., 2020). Respiratory symptoms in the form of cough, dyspnea as well as other symptoms of corona disease affecting the gastrointestinal tract, vomiting, diarrhea, gastric pain, and abdominal pain can be treated and cured without any disability left behind. What attracts the mind of the authors¹² in this study are the neurological symptoms that vary from mild to severe in many patients. Fever was the main symptom in (75.9%) of the patients who experience moderately elevated body temperature to a temperature of 40°C

or above. Elevated body temperature can be attributed to the normal bodily response to pyrogens and toxins released by the infectious agent. Sex variation regarding high temperature was shown to be nonsignificant (8 females against 6 males). 38.4% of the patients exhibit moderate to severe headaches which can be attributed to the involvement of the meninges especially the dura mater when the virus gets access to the brain through the cribriform plate from the upper part of the nose. Because corona disease shares in common some symptoms with influenza virus, therefore, it is not uncommon for the patients to experience loss of smell and taste which was observed in 36.5% and 32% respectively. Fever and increased body metabolism with deprived nutrients lead to exhaustion of the energy sources in the body that in turn can cause malaise, tiredness and muscle pain, this was found in 38.9% and 21.7% respectively. 13.3% of the patients claim that they experience dizziness during the course of the disease, from the neurological point of view dizziness can be caused by brain ischemia and this may happen as a result of brain swelling that accompanies coronavirus disease which compresses the blood vessels of the brain inducing ischemia and dizziness ⁽¹⁸⁾. When the swelling is prominent, it might impair neuronal conduction as well, especially in the narrow areas of the brain (brain stem) so that interrupting the excitatory signals arising from the primary excitatory area in the brain stem from passing to the cerebral cortex, leading to the development of diminished or loss of consciousness. This symptom was observed in (4.9%) of the patients. Diminished neuronal conduction among the different brain areas especially so with the frontal lobe of the brain makes patients with coronavirus unable to maintain a long span of concentration was noticed in 19.4% of the patients.

The key finding of this study is that loss of memory was observed in 20.9% of patients caused by corona disease which affects both short-term and/or long-term memories. Amnesia can be attributed to impaired neuronal conduction among the brain cells, which makes it difficult to retrieve old information from the memory storehouse or to store new one especially when the hippocampus is affected (Zha et al., 2020). Among the available explanations of how the virus gets entry into the brain according to the author's view, is that the virus invades the endothelial cell lining of the blood vessels and passes through the bloodstream into the brain synapses, and is then taken into the nerve cells by endocytosis, both conditions can interrupt neuronal transmission and impair nerve function. These findings firmly establish the connection between loss of memory and corona disease and leave very little doubt about the causal link between coronavirus disease and loss of memory. This disability might be short-lived or life-long depending on the severity of the disease.

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