

## SARS-CoV-2 Infection and Coronavirus Disease (COVID-19) Clinical Data: A Review of the Literature

Nicolas Padilla-Raygoza<sup>1\*</sup>, Cuauhtemoc Sandoval- Salazar<sup>2</sup>,  
Vicente Beltran-Campos<sup>3</sup>, Xochitl Sofia Ramirez-Gomez<sup>3</sup>, María de Jesus  
Gallardo-Luna<sup>4</sup>, Efrain Navarro-Olivas<sup>4</sup> and Daniel Alberto Diaz-Martinez<sup>4</sup>

<sup>1</sup>School of Medicine, University of Celaya, Celaya, México, CP 38080.

<sup>2</sup>Department of Nursing and Obstetrics, Division of Health Sciences and Engineering,  
Campus Celaya-Salvatierra, University of Guanajuato, Celaya, México, CP 38060.

<sup>3</sup>Clinical Nursing, Division of Health Sciences and Engineering, Campus Celaya-Salvatierra,  
University of Guanajuato, Celaya, México, CP 38140.

<sup>4</sup>Institute of Public Health from Guanajuato State, Guanajuato, México CP36,000.

\*Corresponding Author E-mail: npadilla@udec.edu.mx

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The aim was to describe the clinical data from patients with confirmed cases of COVID-19 and clinical data of patients with pneumonia by the same virus. It was selected articles on clinical data from patients with COVID-19 and pneumonia by SARS-CoV-2 in pubmed, embase and google scholar. It was described the clinical data of patients with COVID-19 from 3 studies with 1,078 patients. The main clinical data for COVID-19 were cough 60.4%, fever 40.9%, and production of sputum 26.0%. For pneumonia by SARS-CoV-2, was described clinical data from 495 patients from 5 studies, were fever 77.4%, cough 68.9%, and myoarthralgia 49.9%. In children with COVID-19 was reported cough 48.5%, pharyngeal erythema 46.2%, and fever 41.5%. To use only clinical data to submit patients to RT-PCR test is not good, because many infected patients have not clinical data (asymptomatic carriers) or they did not reported the main clinical data as fever, cough or myoarthralgia.

**Keywords:** COVID-19; Pneumonia; Signs; Symptoms; SARS-CoV-2.

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Since December 8, 2019, several cases of pneumonia were reported in Wuhan, Hubei Province, China<sup>1</sup> and it was reported to the World Health Organization (WHO) office on December 31 of the same year<sup>2</sup>. Several of those patients worked at the Huanan seafood market and a virus was isolated from a patient's throat, which was named 2019-nCoV by WHO and later SARS-CoV-2<sup>3</sup>. Because the increase in cases, in one month, the WHO declared a Public Health

emergency of international interest on January 30, 2020<sup>2</sup>.

The pandemic has spread practically worldwide with more than 200 countries where cases have been confirmed; As of March 30, 2020, 693, 282 confirmed cases, and 33,106 deaths have been reported worldwide<sup>4</sup>.

### SARS-CoV-2

Human coronaviruses belong to the order *Nidovirales*, family *Coronaviridae*, and genus



*Alphacoronavirus* or *Betacoronavirus*, called SARS-CoV-2, can cause coronavirus-19 disease (COVID-19); the virus is highly infectious, the entire population is susceptible, and person-to-person contact, as well as drops expelled when coughing or sneezing, are the main routes of transmission<sup>5,6</sup>.

Aerosol particles may be another source of transmission and there is no evidence of vertical mother-product transmission<sup>7</sup>. Coronaviruses are enveloped non-segmented positive-sense RNA<sup>8</sup>.

After one month from the presentation of the initial case, the virus was isolated, its genome was sequenced and its morphology was described and the sequence was shared with the WHO<sup>9</sup>.

SARS-CoV-2, which causes COVID-19, uses the same input receptor, angiotensin-converting enzyme 2, as SARS-CoV, which is expressed in airway epithelial cells; It is the seventh member of the coronavirus family that infect humans and has higher infectivity than SARS-CoV or MERS-CoV, since SARS-CoV-2, grows better in epithelial cells of the respiratory tract<sup>10</sup>.

The main objective is to describe the signs and symptoms reported to COVID-19, since it is the first way to categorize patients in areas of first level of care.

## METHODS

A search of articles was carried out, with the words of Clinical data, signs and symptoms, COVID-19, Coronavirus, in Spanish and English in Pubmed, Web of Knowledge, Scopus, Google

Scholar, between 23-25 March 2020. In the first instance, it did obtained 2,544 articles, of which those that did not describe the clinical data of COVID-19 were discarded.

Three articles were selected that describe the clinical data of SARS-CoV-2 infection; 5 articles were selected that describe the clinical data of pneumonia caused by SARS-CoV-2; and it did selected 1 article that describes olfactory dysfunction in patients with COVID-19, and 1 editorial that describes the clinical data in children with COVID-19.

## RESULTS

The team reviewed the articles, and selected 3 of them with description of clinical data of COVID-19 (Table 1).

Table 2 show the signs and symptoms reported in the 2 articles<sup>11-13</sup>.

In a series of 9 pregnant women, reported in Wuhan China, they show clinical data on pregnant women infected with SARS-CoV-2<sup>11</sup>.

**Table 1.** Selected articles on clinical data on COVID-19

| Authors     | Number of cases | Reference |
|-------------|-----------------|-----------|
| Chen et al  | 9*              | 11        |
| Liu et al   | 44              | 12        |
| Guan et al  | 926             | 13        |
| Total cases | 1,078           |           |

\* Pregnant women

**Table 2.** Clinical data of COVID-19 (n=1,078)<sup>12-14</sup>

| Symptoms and signs  | 9* <sup>11</sup><br>n (%) | 44 cases <sup>12</sup><br>n (%) | 926 cases <sup>13</sup><br>n (%) |
|---------------------|---------------------------|---------------------------------|----------------------------------|
| Fever               | 7 (77.8)                  | 43 (97.7)                       | 391 (42.2)                       |
| Cough               | 4 (44.4)                  | 25 (56.8)                       | 622 (67.2)                       |
| Dyspnoea            | 1 (11.1)                  | 4 (9.1)                         | 139 (15.0)                       |
| Myoarthralgia       | 3 (33.3)                  | 23 (52.3)                       | 133 (14.4)                       |
| Headache            | 3 (33.3)                  | 18 (40.9)                       | 124 (13.4)                       |
| Sore throat         | 3 (33.3)                  | 6 (13.6)                        | 130 (14.0)                       |
| Rhinorrhoea         | 2 (22.2)                  | 6 (13.6)                        | 99 (10.7)                        |
| Diarrhoea           | 1 (11.1)                  | 5 (11.4)                        | 31 (3.3)                         |
| Nausea and vomiting | NR                        | 3 (6.8)                         | 43 (4.6)                         |
| Expectoration       | NR                        | 16 (36.4)                       | 306 (33.0)                       |

NR Non-reported \* Pregnantwomen

Liu *et al.*<sup>12</sup> studied 44 patients and reported practically the same clinical data as other studies<sup>11,13</sup>. Guan *et al.*<sup>13</sup>, studied 926 cases.

Grouping the 3 selected studies, we found that cough was the main symptom of COVID-19 (60.4%) followed by fever (40.9%) (Table 3).

Regarding the clinical data of patients infected with SARS-CoV-2 and who developed pneumonia, they were reported in 5 studies (Table 4)<sup>12-16</sup>.

And the predominant clinical data in SARS-CoV-2 pneumonia were fever, cough, and Myoarthralgia (Table 5)<sup>12-16</sup>.

Olfactory and gustatory disorders have been reported in patients with COVID-19 described by Reza Bagheri *et al.*<sup>17</sup>, in Iran in March 2020, where they describe the correlation between olfactory dysfunction and COVID-19. More cases with smell disorders need to be identified among the confirmed cases of COVID-19. Accord

to Russell *et al.*<sup>18</sup> there is currently no published evidence or case reports noting anosmia and/or ageusia/dysgeusia in COVID-19 patients.

**Table 3.** Clinical data on total of confirmed cases (n=1,078)<sup>11-13</sup>

| Sign or symptom      | n (%)      |
|----------------------|------------|
| Cough                | 651 (60.4) |
| Fever                | 441 (40.9) |
| Production of sputum | 322 (26.0) |
| Dyspnoea             | 144 (13.4) |
| Myoarthralgia        | 159 (14.7) |
| Headache             | 145 (13.5) |
| Sore throat          | 139 (12.9) |
| Rhinorrhoea          | 107 (9.9)  |
| Nausea and vomiting  | 46 (4.3)   |
| Diarrhoea            | 37 (3.4)   |

**Table 4.** Clinical data of pneumonia caused by CSAR-CoV-2<sup>12-16</sup>

| Symptoms and signs  | 41 cases <sup>14</sup><br>n (%) | 99 cases <sup>15</sup><br>n (%) | 138 cases <sup>16</sup><br>n (%) | 44 cases <sup>12</sup><br>n (%) | 173 cases <sup>13</sup><br>n (%) |
|---------------------|---------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| Fever               | 40 (97.6)                       | 82 (82.8)                       | 136(98.6)                        | 43 (97.7)                       | 82 (47.4)                        |
| Cough               | 31 (75.6)                       | 81 (81.8)                       | 82 (59.4)                        | 25 (56.8)                       | 122 (70.5)                       |
| Dyspnoea            | 22 (53.7)                       | 31 (31.3)                       | 43 (31.2)                        | 4 (9.1)                         | 65 (37.6)                        |
| Myoarthralgia       | 18 (43.9)                       | 11 (11.1)                       | 96 (69.6)                        | 23(52.3)                        | 99 (57.2)                        |
| Headache            | 3 (7.3)                         | 8 (8.1)                         | 9 (6.5)                          | 18(40.9)                        | 26 (15.0)                        |
| Sore throat         | NR                              | 5 (5.1)                         | 24 (17.4)                        | 6 (13.6)                        | 23 (13.3)                        |
| Rhinorrhoea         | NR                              | NR                              | NR                               | 6(13.6)                         | NR                               |
| Diarrhoea           | 1 (2.4)                         | 2 (2.0)                         | 14 (10.1)                        | 5(11.4)                         | 10 (5.8)                         |
| Nausea and vomiting | NR                              | 1 (1.0)                         | 19 (13.8)                        | 3 (6.8)                         | 12 (6.9)                         |
| Expectoration       | 11 (26.8)                       | NR                              | 37(26.8)                         | 16 (36.4)                       | 61 (35.3)                        |

**Table 5.** Clinical data of pneumonia caused by SARS-CoV-2, all patients together (n=495)<sup>12-16</sup>

| Sign or symptom      | n (%)      |
|----------------------|------------|
| Fever                | 383(77.4)  |
| Cough                | 341 (68.9) |
| Myoarthralgia        | 247 (49.9) |
| Dyspnoea             | 165 (33.3) |
| Production of sputum | 125 (25.3) |
| Headache             | 64 (12.9)  |
| Sore throat          | 58 (11.7)  |
| Nausea and vomiting  | 45 (9.1)   |
| Diarrhoea            | 32 (6.5)   |
| Rhinorrhoea*         | 6 (1.2)    |

**Table 6.** Clinical data in children (n=171)<sup>19</sup>

| Signs and symptoms  | n  | %    |
|---------------------|----|------|
| Cough               | 83 | 48.5 |
| Pharyngeal erythema | 79 | 46.2 |
| Fever               | 71 | 41.5 |
| Diarrhoea           | 15 | 8.8  |
| Fatigue             | 13 | 7.6  |
| Rhinorrhoea         | 13 | 7.6  |
| Vomiting            | 11 | 6.4  |
| Nasal congestion    | 9  | 5.3  |
| Tachypnoea          | 49 | 28.7 |
| Tachycardia         | 72 | 42.1 |

\* Only reported in one study

And, specifically in children, an editorial was found describing the clinical data of 171 infected children with ages from less than 1 to 15 years old, men predominated (60.8%) and Table 6 shows the reported clinical data, being the cough was more frequent, where they reported 15.8% asymptomatic infection, Upper respiratory tract infection (19.3%) and pneumonia (64.9%)<sup>19</sup>.

### DISCUSSION

With these reports and a total sample of 1,283 cases of COVID-19, the most frequent clinical data were fever (90.4%), cough (62.2%) and expectoration (23.2%) (Table 3)

The clinical data of confirmed COVID-19 patients, is the first line of classification to decide whether to apply the diagnostic test to detect SARS-CoV-2. And it is important to highlight that a suspicious case was that with dry cough and in the clinical pictures in China, they show that around 26% had expectoration production (Table 3) and could leave many people without performing the PCR for detection of SARS-CoV-2.

The importance of the pandemic is such that it has exceeded the capacities of the health systems even in developed countries and with greater amounts of financial and technological resources. In Mexico, the first line of classification of patients is the clinical picture, according to the guidelines generated by the Ministry of Health and published by the General Directorate of Epidemiology on March 17, 2020<sup>20</sup>.

According to them, suspicious cases are those with fever and / or cough and who at least have dyspnoea or myoarthralgia, headache, odynophagia and have had contact with a case or have travelled to a high-risk country. A confirmed case is a suspected case that tested positive for SARS-CoV-2 in laboratories of the National Network of Public Health Laboratories with Real Time- Polymerase Chain Reaction (RT-PCR)<sup>20</sup>.

This classification for testing may exclude asymptomatic carriers, and they are important for the spread of infection, despite measures taken by country governments such as suspension of non-essential activities, social isolation, and other preventive measures such as hand hygiene and healthy distance.

Regarding the clinical picture reported

for cases with SARS-CoV-2 pneumonia, the most frequent was fever (77.4%), cough (68.9%) and myoarthralgia (49.9%) (Table 5). But these clinical data are not different from another pneumonia of viral or bactericidal origin

Comparing the clinical pictures of SARS-CoV-2 infection and SARS-CoV-2 pneumonia are similar but there are not difference with another upper respiratory tract viral infections or pneumonia from viral or microbe origin.

In children, the clinical data of 171 children were reported<sup>19</sup> (Table 6) and the clinical picture is similar to that of adults with fever and cough, adding pharyngeal erythema.

### CONCLUSION

The clinical data from COVID-19 are common in upper respiratory tract viral infections different to SARS-CoV-2 infection.

Pneumonia by SARS-CoV-2 show the same clinical data that another viral or bacterial pneumonia.

It is not to be trusted to establish only with a clinical picture whether or not the test is done according to a comprehensive assessment.

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