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# Anosmia in COVID-19 Patients at a Health Center in Yogyakarta, Indonesia

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**Abstract**

**BACKGROUND:** SARS-CoV-2, which causes COVID-19, is one of the viruses that has been spreading globally since 2019.

**AIM:** This research aims to see how common anosmia is among COVID-19 patients.

**MATERIALS AND METHODS:** A retrospective study with a consecutive sample and quantitative descriptive design was utilized to collect data by spreading questionnaires on patient experiences COVID-19 infection. COVID-19 was detected by RT-PCR at a Health Center in Yogyakarta, Indonesia.

**RESULT:** A total of 124 persons tested positive for COVID-19. The remaining 59% experienced no anosmia or smell issues. Anosmia was present in 40.3% of those examined, 57.3% of those tested had no anosmia before or after the RT-PCR test and 31.5 had it before being diagnosed with COVID-19. Less than 5 days, 13.7% of those who had recovered, whereas 22.6% had more than 5 days to recover.

**CONCLUSION:** People who were diagnosed as COVID-19 positive using the RT-PCR test had the symptom earlier than those who reported anosmia after diagnosis, according to when they first reported it.

## Introduction

The global pandemic of COVID-19 began in December 2019 in Wuhan, China [1]. This kind of virus attacks humans' immune and respiratory systems. The respiratory system supports life [2], and its upper part has the nose, pharynx, and larynx. Besides, the lower section has lungs, trachea, diaphragm, and other structures. Considering the COVID-19 situation, people need to be more aware of their health, specifically in the respiratory system, which is majorly attacked by the coronavirus [2]. According to the previous research, it is stated that "Otolaryngologists should be aware of anosmia to avoid delaying the diagnosis of COVID-19, thereby contributing to an epidemic" [3].

Anosmia concerns the respiratory system and COVID-19 is one of the symptoms encountered when infected. This is a part of the smell disorders that affect the immune and respiratory systems [4]. Corona disease is dangerous and causes death once there is no exact recovery. Anosmia is possibly caused by loss of BBS protein [5], diseases of inflammation and obstruction, neurological disorders, neurodegenerative processes, congenital conditions, and infective conditions [6] such as COVID-19 [7]. In this situation, the peripheral nervous system (PNS) involvement is hypogeusia (5.6%) and hyposmia (5.1%). In accordance with the pathophysiology of anosmia, the pathogenic virus spreads throughout the nervous system and has a cytopathic effect on the neurons [8]. Then, the primary neurons in the cortex and hypothalamus are affected [9].

A previous report of anosmia cases discovered in South Korea, China, and Italy and also mentioned that some COVID-19 patients have this symptom [10], [11]. The research from various countries observed COVID-19 patients presenting isolated anosmia, but without any other symptoms" [11]. Although no particular result still links anosmia presence to indicate COVID-19, almost in every case of COVID-19, the patients claimed to have anosmia. It was as well stated that "the role of intranasal steroids is debatable in this situation accruing the possibility of triggering upper respiratory tract infection" [12]. "A further argument against the initial hypothesis is that SARS-CoV2-associated meningitis is rare, but smelling/taste abnormalities are frequent" [13].

A similar low percentage of anosmia (5%) was reported using the same methodology in a large German community. Sadly, the 12-stick test cannot differentiate hyposmia from normosmia (44% of COVID-19 patients) must be interpreted carefully [14]. Anosmia on the COVID-19 test was found in 54 out of

114 patients. After the infection was present for 4 days, anosmia developed. The average length of anosmia was 8 days, with a success rate of 98%. It took 28 days for the patient to recover [15], [16].

Anosmia is a good predictor of COVID-19 [16] because the patients commonly have smell disorders. The purpose of the present study is to figure out the number of anosmia with other symptoms that appear in cases of COVID-19. The total anosmia cases reported by the respondents and the length of recovery from the symptom are to be determined.

## Materials and Methods

A retrospective study with a consecutive sample quantitative descriptive design was utilized to collect data by spreading questionnaires on patient experiences before, during, and after COVID-19 infection. RT-PCR commonly detects COVID-19 on nasopharyngeal and oropharyngeal swabs worldwide, including at the Health Center in Yogyakarta, Indonesia. All respondents were >18 years old. The study eliminated subjects with insufficient data, a history of anosmia, psychological problems, or who were lost to follow-up. The results were divided into two, for male and female cases, then anosmia symptoms raised in the respondents were explained, and all the data were reported in the form of frequency. The data collected were analyzed using IBM-SPSS version 22.

The Research Ethics Committee approved the study of Muhammadiyah University of Yogyakarta (No: 298/EC-KEPK FKIK UMY/XII/2020). All respondents' information collected during the survey was kept strictly confidential.

## Results

The study enrolled 124 individuals who fulfilled the inclusion and exclusion criteria. Table 1 shows the frequency of gender diagnosed as COVID-19 positive by RT-PCR test.

**Table 1: The frequency of gender**

| Variable | Frequency | Percent |
|---|---|---|
| Female | 72 | 58.1 |
| Male | 52 | 41.9 |

According to Table 1, the total respondents were 124 patients positive for COVID-19. In this research, the data of anosmia detected were explained. Furthermore, Table 2 showed that the total respondents had anosmia before, during, or after diagnosis as COVID-19 positive. The remaining 74 patients did not have anosmia or smell disorder, while they were determined as positive or not.

**Table 2: The frequency of patients with anosmia**

| Variable | Frequency | Percent |
|---|---|---|
| No | 74 | 59.7 |
| Yes | 50 | 40.3 |

In addition to the information in Table 2, it was concluded that the number of people who had anosmia before, during, or after being confirmed as positive was relatively high, with a value of 40.3%. The number was explained to mean anosmia that is one of the highest symptoms that might appear in COVID-19 cases.

Subsequent data showed the time at which anosmia was experienced, either before, during, or after the COVID-19 confirmation. Table 3 shows the result of the respondents' answers.

**Table 3: The frequency of the time patients experienced anosmia**

| Variable | Frequency | Percent |
|---|---|---|
| No anosmia | 71 | 57.3 |
| Before diagnosis | 39 | 31.5 |
| After diagnosis | 14 | 11.3 |

Table 3 shows the number of patients who did not experience anosmia/olfactory dysfunction before or after the RT-PCR test. Meanwhile, those who had the symptom before being diagnosed as COVID-19 positive. Finally, only 14 out of 124 had the symptom after diagnosis.

The length of recovery time from anosmia was based on the data provided in the distributed questionnaires. The values were different for each person. Therefore, they were divided into four categories. Table 4 shows the frequency and percentage of the length of recovery time.

**Table 4: The frequency of the length of recovery time**

| Variable | Frequency | Percent |
|---|---|---|
| No anosmia cases | 72 | 58.1 |
| >5 days | 28 | 22.6 |
| <5 days | 17 | 13.7 |
| Not yet perfectly recovered | 7 | 5.6 |

In Table 5, the mean obtained from the frequency of recovery time length indicated that the patients recovered from anosmia within <5 days.

**Table 5: The mean of the length of recovery time**

| Variable | Frequency | Mean |
|---|---|---|
| The frequency of the length of recovery time | 124 | 1.76 |

As seen in Table 6, other symptoms proved that anosmia is present in the COVID-19 cases, particularly in patients tested by RT-PCR. These included dysgeusia, fever, gastrointestinal disorder, cough, sore mouth, nasal congestion, dizziness, sore throat, dyspnea, nausea, hallucinations, and myalgia. From the result, the number of other symptoms (excluding anosmia) was higher, namely, fever with 15.6%, followed by cough with 9.3%. The previous research also proved that fever, cough, and myalgia tend to be the main COVID-19 symptom [17], [18], [19].

**Table 6: The frequency and percentage of the symptom felt by patients**

| Variable | Frequency | Percent |
|---|---|---|
| No symptom | 46 | 19.4 |
| Fever | 37 | 15.6 |
| Anosmia | 32 | 13.5 |
| Cough | 22 | 9.3 |
| Nasal congestion | 17 | 7.2 |
| Dizziness | 17 | 7.2 |
| nasal discharge | 16 | 6.8 |
| Dysgeusia | 15 | 6.3 |
| Gastrointestinal disorder | 15 | 6.3 |
| Sore throat | 10 | 4.2 |
| Dry mouth | 4 | 1.7 |
| Dyspnea | 2 | 0.8 |
| Myalgia | 2 | 0.8 |
| Nausea | 1 | 0.4 |
| Hallucinations | 1 | 0.4 |

## Discussion

The previous research has similarities with the current research, namely, finding out the symptoms of anosmia that can detect COVID-19 early [15], [16], [20], [21]. The previous research explains the relationship between anosmia and COVID-19, where there was a link between anosmia and COVID-19 [6], [9], [13]. It is stated that anosmia can be used to detect early symptoms of COVID-19, which can help detect COVID-19 patients so that they can be quarantined to prevent the spread of the virus [3], [4], [5]. COVID-19 is a pandemic caused by a novel SARS-CoV-2 virus that affects the human lower respiratory tract [18]. All the patients infected by COVID-19, only half of all enrolled patients had anosmia [16]. Therefore, anosmia became the highest symptom that appeared in COVID-19 cases.

The first result of this study showed that 124 respondents filled out the provided form, and they were divided into two gender categories, 72 females (58.1%) and 52 males (41.9%). The criteria of selected subjects were individuals confirmed as COVID-19 positive using the RT-PCR test. According to the previous research conducted, female respondents were 36 out of 54 confirmed as COVID-19 positive [16].

The following result showed that the score of anosmia cases was relatively high, with 40.3% or 50 people. Meanwhile, it was previously reported that the number of patients with anosmia was 54 out of 114, or 47% [16]. Therefore, anosmia became the highest symptom that appeared in COVID-19 cases.

Based on the total responses, more than 5 days were required for 28 patients (22.6%) to recover from their respiratory dysfunction. According to the previous research, recovery time was the mean duration for anosmia to disappear in a COVID-19 case, where 8.9% recovered within 6.3 days and 98% recovered after 28 days [16].

The previous research explains that half of the people infected by COVID-19 also have anosmia symptoms. To detect the COVID-19 viruses in the human body, the doctors do the RT-PCR test on patients and find out that the most of the females who get COVID-19 also experience symptoms of anosmia (16). The previous research shows that some patients need more than 5 days to recover from their respiratory dysfunction. In that recovery process, few patients can recover from anosmia to disappear in a COVID-19 case within 6.3 days, when the most of the patients need 28 days to recover [17].

The previous study provided information on COVID-19, specifically its symptom, that is, anosmia [16]. The difference between the current and previous research is that this recent research reported and investigated the number of anosmia with other symptoms in COVID-19 cases. Anosmia was mainly discussed in this section.

The remaining explanation is about the other symptoms claimed by patients; other symptoms found proved that not only is anosmia present in the COVID-19 cases, particularly in patients tested by RT-PCR. These included dysgeusia, fever, gastrointestinal disorder, cough, sore mouth, nasal congestion, dizziness, sore throat, dyspnea, nausea, hallucinations, and myalgia. The previous research also proved that fever, cough, and myalgia tend to be the main COVID-19 symptom [17], [19].

One of the possible treatments for patients with anosmia was empirical oral steroids usage. This has the potential to decrease inflammation and edema [9]. Furthermore, olfactory training can be employed, which is helpful in postinfectious olfactory loss [20]. Other research showed that saline nasal irrigation treats anosmia [20]. This method seemingly effectively decreases or even erases viruses from the upper respiratory system. Steroids are a popular therapy for anosmia patients [21].

This research only examines the symptoms of anosmia in patients who have experienced, during, and after experiencing COVID-19 infection and have been tested using RT-PCR at the Health Center in Yogyakarta, Indonesia. This research does not examine other symptoms of patients other who get treatment. This research did not examine further anosmia symptoms in patients treated outside the Yogyakarta Health Center or in other cities in Indonesia. This research only investigated the number of anosmia with other symptoms that appeared in COVID-19 cases.

## Conclusion

The prevalence of anosmia in COVID-19 patients at a Health Center in Yogyakarta, Indonesia is 40.3%. There were many incidents of anosmia during the COVID-19 epidemic at a Health Center in Yogyakarta, Indonesia. People diagnosed as COVID-19 positive

using the RT-PCR test had the symptom earlier than those who reported anosmia after diagnosis, according to when they first reported it.

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