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CHARACTERISTICS OF SMELL AND TASTE DISORDERS IN CORONAVIRUS DISEASE-2019 PATIENTS AT HAJI ADAM MALIK GENERAL HOSPITAL MEDAN

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Abstract

Introduction : In 2020 the pandemic caused by *Coronavirus Disease* (COVID-19) affects the lives of millions of patients and healthcare workers around the world. Smell and taste disturbances were found as a single symptom and were associated with other symptoms. This research aims to know the frequency distribution of smell and taste disorders and describe their characteristics in COVID-19 patients.

Method: Analytical descriptive study with a retrospective approach in the population of COVID-19 patients at Haji Adam Malik General Hospital (RSUP HAM) Medan for the period March to August 2020. The variables assessed were frequency distribution, percentage of smell and taste disorders, age, gender, and the results of the Polymerase Chain Reaction examination. (PCR).

Result: A total of 193 COVID-19 patients, It was found that 66 people (34.2%) experienced smell disorders and 76 people (39.4%) experienced taste disorders. Most age <50 years as many as 45 subjects (68.2%) and 51 subjects (67.1%), the most gender was female with 40 subjects (60.7%) and 45 subjects (59.2%), most ethnic group was Bataknese 26 subjects (39.3%) and 31 subjects (40.8%) with the most employment status was civil servants 27 subjects (40.9%) and 30 subjects (39.5%). There were smell disorders in COVID-19 patients with a positive PCR of 53.9% and a negative PCR of 12.1%; taste disorders in subjects with positive PCR was 62.7% and negative PCR was 13.2%.

Conclusion: In COVID-19 patients, there were 34.2% smell disorders and 39.4% taste disorders with most characteristics aged <50 years (68.2% and 67.1%), female sex (60.7% and 59.2 %), with positive PCR results (53.9% and 62.7%).

Introduction

Coronavirus disease 2019 (COVID-19) is a pandemic in 2020 that affects the lives of millions of patients and health workers around the world. *Coronavirus disease* is a new type of virus *Severe Acute Respiratory Syndrome Corona Virus 2* (SARS COV-2).¹ *Coronavirus* is a *single-strand Ribonucleic acid* (RNA) virus originating from the *Orthocoronavirinae* subfamily called zoonotic viruses with S protein protruding from a crown-like surface. This virus has a diameter of 50-200 nm.² According to data from the *World Health Organization* (WHO) in August 2020 there were 34,396,222 cases infected with COVID-19 in the world, the death rate was 1,024,625 cases and there were 235 countries in the world.³ In Indonesia August 2020 there were 160,695 infected cases with a death rate of 6,995 cases and a cure rate of 115,409 cases.⁴

The clinical manifestations of COVID-19 vary from asymptomatic to severe symptoms. At present, clinical manifestations in COVID-19 patients with smell and taste disorders have increased and found as a single symptom and associated with other symptoms.¹ According to a study conducted by Plasschaert et al. (2020) reported that there is a mechanism for anosmia in patients with COVID-19 resulting in local infection of the nasal mucosa resulting in bowman cell damage and damage to olfactory epithelial cells which can indirectly affect the signaling pathway of sensory neurons to the brain and results in diffuse morphological damage to the olfactory sensory epithelium and changes in olfactory perception.⁵ Meanwhile, according to Vaira et al. (2020) taste disturbances occur because Protein S binds to ACE-2 in the oral mucosa through the oral cavity and binds to *sialic acid* receptors and occupies and accelerates the degradation of gustatory particles.⁶ According to the study of Leichen et al. (2020), it was reported that in patients with COVID-19, it was confirmed by examining *Polymerase Chain Reaction* (PCR), which was 85,6% of the patients experienced smell disorders and 88.8% had taste problems.⁷

Method

This research is descriptive analytic with a *cross sectional* design with a retrospective approach, the data source is obtained from secondary data in the form of medical records of COVID-19 patients with a history of smell and



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taste disorders of patients treated in the isolation room of RSUP H. Adam Malik Medan from March 2020 to August 2020 with *Total sampling* technique. The inclusion criteria for COVID-19 patients were enforced based on history, physical examination and PCR examination. The study subjects were 193 COVID-19 patients, which were divided into 102 with positive PCR results and 91 with negative PCR results. The data from the study were statistically analyzed using the SPSS version 22.0 computer program.

Results

Table 1. Description of the Characteristics of Research Subjects

Respondent characteristics	Average	COVID-19		n (193)	Percentage (%)
		PCR (+)	PCR (-)		
Age (years)					
• 18-40 years		50 (49.0%)	48 (52.7%)	98	50.8%
• > 40-63 years	40 (18 - 84)	45 (44.1%)	32 (35.2%)	77	39.9%
• > 63-86 years	years	7 (6.9%)	11 (12.1%)	18	9.3%
Gender					
• Male		40 (39.2%)	46 (50.5%)	86	44.6%
• Women		62 (60.8%)	45 (49.5%)	107	55.4%
Tribe					
• Aceh		4 (3.9%)	1 (1.1%)	5	2.6%
• Bataknese		41 (40.2%)	48 (52.7%)	89	46.1%
• Karonese		13 (12.7%)	12 (13.2%)	25	13.0%
• Nias		1 (1.0%)	1 (1.1%)	2	1.0%
• Minang		1 (1.0%)	0 (0%)	1	0.5%
• Malay		25 (24.5%)	18 (19.8%)	43	22.3%
• Javanese		17 (16.7%)	10 (11%)	27	14.0%
• Chinese		1 (1.0%)	1 (1.1%)	2	1.0%
Profession					
• Civil servants		43 (42.2%)	12 (13.2%)	55	28.5%
• IRT		18 (17.6%)	18 (19.8%)	36	18.7%
• entrepreneur		31 (30.4%)	32 (35.2%)	63	32.6%
• Doctor		5 (4.9%)	1 (1.1%)	6	3.1%
• Student		2 (2.0%)	19 (20.9%)	21	10.9%
• Farmer		1 (1.0%)	6 (6.6%)	7	3.6%
• Retirees		0 (0%)	3 (3.3%)	3	1.6%
• Nurse		2 (2.0%)	0 (0.0%)	2	1.0%
Total		102	91	193	

Based on table 1 of all the 193 samples of COVID-19 research subjects (102 positive PCR subjects and 91 negative PCR subjects), it was found that age characteristics had a median value of about 40 (18-84) years with the largest age range at 18-40 as 98 subjects (50.8%) followed by age >40-63 years with 77 subjects (39.9%) and aged >63-68 with 18 subjects (9.3%). Most of the COVID-19 subjects were female with 107 subjects (55.4%) followed by male with 86 subjects (44.6%). The most ethnic group was Bataknese with 89 subjects (46.1%) followed by Malay with 43 subjects (22.3%), Javanese 27 subjects (14.0%), Karonese 25 subjects (13.0%), Aceh 5 subjects (2.6%), Nias and Tionghoa 2 subjects each (1.0%) and at least 1 subject (0.5%) of the Minang ethnicity. The most occupational was self-employed, namely 63 subjects (32.6%) followed by civil servants 55 subjects (28.5%), housewives (IRT) 36 subjects (18.7%), students 21 subjects (10.9%), farmers 7 subjects (3.6%), Doctors 6 subjects (3.1%), retirees 3 subjects (1.6%) and Nurses 2 subjects (1.0%).

*Table 2. Frequency Distribution Smell and Taste Disorders of COVID-19 Patients*

	COVID-19		Total
	PCR (+)	PCR (-)	
Smelling Disorders			
• Yes	55 (53.9%)	11 (12.1%)	66 (34.2%)
• Not	47 (46.1%)	80 (87.9%)	127 (65.8%)
Taste Disorders			
• Yes	64 (62.7%)	12 (13.3%)	76 (39.4%)
• Not	38 (37.3%)	79 (86.7%)	117 (60.6%)

Based on table 2, it is found that the frequency distribution of smell disorders in COVID-19 patients is 66 subjects (34.2%), of which 55 subjects (53.9%) with PCR (+) and 11 subjects (12.1%) with PCR (-). The percentage of smell disorders in COVID-19 patients with PCR (+) was higher than PCR (-). Distribution of the frequency of taste disorders in COVID-19 patients amounted to 76 subjects (39.4%) where as many as 64 subjects (62.7%) with PCR (+) and 12 subjects (13.2%) with PCR (-). The percentage of taste disorders in COVID-19 patients with PCR (+) was higher than PCR (-).

Table 3. Characteristics COVID-19 Patients with Smelling and Taste Disorders

Characteristics	COVID-19			
	Smelling Disorders		Taste Interference	
	N	%	N	%
Age (years)				
• <50 years	45	68.2%	51	67.1%
• ≥ 50 years	21	31.8%	25	32.9%
Gender				
• Male	26	39.3%	31	40.8%
• Women	40	60.7%	45	59.2%
Tribe				
• Aceh	2	3.0%	0	0%
• Bataknese	26	39.3%	31	40.8%
• Karonese	10	15.1%	6	7.9%
• Nias	0	0%	0	0%
• Minang	1	1.5%	0	0%
• Malay	16	24.2%	23	30.2%
• Javanese	11	16.6%	16	21.1%
• Chinese	0	0%	0	0%
Profession				
• Civil servant	27	40.9%	30	39.5%
• Housewives	13	19.6%	11	14.5%
• entrepreneur	18	27.2%	21	27.7%
• Doctor	4	6.0%	4	5.2%
• Nurse	2	3.0%	2	2.6%
• Student	1	1.5%	4	5.2%
• Farmer	0	0%	2	2.6%
• Retirees	1	1.5%	2	2.6%



Total	66	100%	76	100%
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COVID-19 patients with smell disorders has the largest age range <50 years as many as 45 subjects (68.2%) and ≥ 50 years as many as 21 subjects (31.8%). Women patients are more than men, namely 40 subjects (60.7%) and 26 subjects (39.3%). The largest ethnic group is the Batakese with 26 subjects (39.3%) followed by Malay ethnic groups with 16 subjects (24.2%), Javanese with 11 subjects (16.6%), Karonese 10 subjects (15.1%), Aceh 2 subjects (3.0%) and Minang 1 subject (1.5%). The most occupational status was civil servants with 27 subjects (40.9%) followed by self-employed 18 subjects (27.2%), housewives 13 subjects (19.6%), Doctor 4 subjects (6.0%), nurses 2 subjects (3.0%), students and retirees each 1 subject (1.5%).

COVID-19 patients with taste disorders have the largest age range <50 years as many as 51 subjects (67.1%) and ≥ 50 years as many as 25 subjects (32.9%). Most of the COVID-19 subjects with taste disorders were female with 45 subjects (59.2%) followed by male with 31 subjects (40.8%). The largest ethnic group was Batakese with 31 subjects (40.8%) followed by Malays with 23 subjects (30.2%), Javanese 16 subjects (21.1%) and Karonese 6 subjects (7.9%). Most of the job status was civil servants with 30 subjects (39.5%) followed by self-employed 21 subjects (27.7%), housewives 11 subjects (14.5%), Doctor 4 subjects (5.2%), students 4 subjects (5.2%), nurses, farmers and retirees each of 2 subjects (2.6%). The characteristics of COVID-19 patients with smell and taste disorders can be seen in table 3.

Discussion

In this study the mean overall age was 40 (18-84) years in line with Leichen et al. (2020), the mean age of COVID-19 patients was 37 ± 11.4 years, which is different from the research of Klopfeinsten et al. (2020) stated that the mean age was ± 57 years. The difference in the average age is one of the risk factors that make COVID-19 more severe because in the elderly they have long-term health problems so that they are more at risk when exposed to the virus, a person's immune system decreases when they reach old age, making it difficult to fight infection.⁴ In this study, the majority of subjects were female, namely 55.4%, in line with the study of Leichen et al. (2020), namely 68% and Klopfeinsten et al. (2020) 63.1% in women. men, namely 60%.⁹

In this study, the smell disorders in COVID-19 patients with PCR (+) and PCR (-) were found to be 53.9% and 12.1%, so it can be concluded that the percentage of smell disorders in COVID-19 patients with PCR (+) is more compared to PCR (-). Taste disorders in COVID-19 patients with PCR (+) and PCR (-) were found to be 62.7% and 13.2% so it can be concluded that the percentage of taste disturbances in COVID-19 patients with PCR (+) is more than PCR (-). In line with the study by Klopfeinsten et al (2020) reported more anosmia than dysgeusia in COVID-19 patients, namely 53% and 48% .⁸ This is in contrast to the study conducted by Leichen et al. (2020) which reported smell and taste disorders, namely 85.6. % and 88%, while Mao et al. (2020) also reported taste and smell disorders, namely 5.6% and 5, 1%.^{7,10}

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