

Strategy 841090/saved

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Contents 29 of 29 results on Saved Results

1. [Possible unregistered SARS-CoV-2 infection in a young man with anosmia and ageusia].....	Page 2
2. Anosmia and Dysgeusia in the Absence of Other Respiratory Diseases: Should COVID-19 Infection Be Considered?	Page 2
3. A New Symptom of COVID-19: Loss of Taste and Smell.....	Page 2
4. Anosmia and ageusia are emerging as symptoms in patients with COVID-19: What does the current evidence say?	Page 2
5. Clinical Presentation of COVID-19: A Systematic Review Focusing on Upper Airway Symptoms.	Page 3
6. Smell dysfunction: a biomarker for COVID-19.	Page 3
7. A primer on viral-associated olfactory loss in the era of COVID-19.	Page 3
8. Smell and taste dysfunction in patients with COVID-19.....	Page 4
9. SARS-CoV-2: Olfaction, Brain Infection, and the Urgent Need for Clinical Samples Allowing Earlier Virus Detection.....	Page 4
10. Features of anosmia in COVID-19.....	Page 4
11. Isolated sudden onset anosmia in COVID-19 infection. A novel syndrome?	Page 5
12. COVID-19 pandemic: Effects and evidence-based recommendations for otolaryngology and head and neck surgery practice.....	Page 5
13. Cerebellar Scholars' Challenging Time in COVID-19 Pandemia.	Page 6
14. Possible link between anosmia and COVID-19: sniffing out the truth.	Page 6
15. Association of chemosensory dysfunction and Covid-19 in patients presenting with influenza-like symptoms.....	Page 6
16. The use of google trends to investigate the loss of smell related searches during COVID-19 outbreak.....	Page 7
17. Presentation of new onset anosmia during the COVID-19 pandemic	Page 7
18. Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China	Page 8
19. Olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study	Page 8
20. Sudden and Complete Olfactory Loss Function as a Possible Symptom of COVID-19.....	Page 9
21. Causes of hypogeusia/hyposmia in SARS-CoV2 infected patients.....	Page 9
22. COVID-19 in otolaryngologist practice: a review of current knowledge.....	Page 9
23. Utility of hyposmia and hypogeusia for the diagnosis of COVID-19.	Page 10
24. Anosmia in a healthcare worker with COVID-19 in Madrid, Spain.	Page 10
25. Urticarial eruption in COVID-19 infection.....	Page 10
26. Anosmia and Ageusia: Common Findings in COVID-19 Patients.	Page 10
27. [The Covid-19 pandemic and otolaryngology: What it comes down to?]	Page 11
28. Identification of viruses in patients with postviral olfactory dysfunction.	Page 11
29. Olfactory neuropathy in severe acute respiratory syndrome: report of A case.....	Page 11
Full search strategy	Page 12

Results Saved Results

29 of 29 saved results

1. [Possible unregistered SARS-CoV-2 infection in a young man with anosmia and ageusia].

Authors Stripp TK; Søndergaard J
Source Ugeskrift for læger; ; vol. 182 (no. 16)
Publication Type(s) Case Reports; Journal Article
PubMedID 32286214
Database PubMed
Abstract During the SARS-CoV-2 pandemic, testing of suspected cases in Denmark has recently been limited to those who were critically ill. This has left an increasing number of unregistered infections in the society, obscured quantification and impacted lived lives. This case story reports a possible mild SARS-CoV-2 infection in a healthy young man in his twenties. Due to strategic guidelines, he was never tested for SARS-CoV-2, but the medical record was highly suspicious for infection. Besides the well-known symptoms of SARS-CoV-2, this case also reports total anosmia and ageusia.

2. Anosmia and Dysgeusia in the Absence of Other Respiratory Diseases: Should COVID-19 Infection Be Considered?

Authors Villalba, Noel Lorenzo; Maouche, Yasmine; Ortiz, Maria Belen Alonso; Sosa, Zaida Cordoba; Chahbazian, Jean Baptiste; Syrovatkova, Aneska; Pertoldi, Pierre; Andres, Emmanuel; Zulfiqar, Abrar-Ahmad
Source European journal of case reports in internal medicine; 2020; vol. 7 (no. 4); p. 001641
Publication Date 2020
Publication Type(s) Journal Article
PubMedID 32309267
Database Medline
Abstract We describe two elderly patients evaluated at emergency departments for anosmia/dysgeusia in the absence of any other respiratory symptoms prior to or upon admission. In the current epidemiological context, clinical and biological work-up led to a diagnosis of COVID-19 infection. Unfortunately, one of the patients died during hospitalization, but the other recovered and was discharged. LEARNING POINTS In the current epidemiological situation, anosmia and dysgeusia in the absence of other respiratory conditions should be carefully evaluated. Special attention should be given to patients with non-classic COVID-19 symptoms in order to reduce transmission and protect health providers.

3. A New Symptom of COVID-19: Loss of Taste and Smell

Authors Gautier J.-F.; Ravussin Y.
Source Obesity; 2020
Publication Date 2020
Publication Type(s) Letter
PubMedID 32237199
Database EMBASE
 Available at [Obesity \(Silver Spring, Md.\)](#) from Wiley Online Library
 Available at [Obesity \(Silver Spring, Md.\)](#) from Unpaywall

4. Anosmia and ageusia are emerging as symptoms in patients with COVID-19: What does the current evidence say?

Authors Russell B; Moss C; Rigg A; Hopkins C; Papa S; Van Hemelrijck M
Source Ecancermedalscience; 2020; vol. 14 ; p. ed98
Publication Date 2020
Publication Type(s) Editorial
PubMedID 32269598
Database PubMed
 Available at [Ecancermedalscience](#) from Europe PubMed Central - Open Access
 Available at [Ecancermedalscience](#) from Unpaywall
Abstract There have been several reports noting anosmia and ageusia as possible symptoms of COVID-19. This is of particular interest in oncology since patients receiving some cancer treatments such as chemotherapy or immune therapy often experience similar symptoms as side-effects. The purpose of this report was to summarise the evidence on the existence of anosmia and ageusia as emerging COVID-19 symptoms in order to better inform both oncology patients and clinicians. Currently, there is no published evidence or case reports noting anosmia or ageusia as symptoms of COVID-19. Nevertheless, experts in rhinology have suggested that the onset of such symptoms could either act as a trigger for testing for the disease where possible, or could be a new criterion to self-isolate. Whilst more data is currently needed to strengthen our knowledge of the symptoms of COVID-19, oncology patients who are concerned about anosmia or ageusia in the context of their systemic anti-cancer therapy should contact their acute oncology support line for advice.

5. Clinical Presentation of COVID-19: A Systematic Review Focusing on Upper Airway Symptoms.

Authors Lovato, Andrea; de Filippis, Cosimo
Source Ear, nose, & throat journal; Apr 2020 ; p. 145561320920762
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32283980
Database Medline
 Available at [Ear, nose, & throat journal](#) from Unpaywall
Abstract AIMPharyngodynia, nasal congestion, rhinorrhea, smell, and taste dysfunctions could be the presenting symptoms of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2. The aim was to perform a systematic review of current evidences on clinical presentation of COVID-19, focusing on upper airway symptoms in order to help otolaryngologists identifying suspected cases.METHODSWe searched PubMed and Web of Science electronic databases.RESULTSWe included 5 retrospective clinical studies for a total of 1556 hospitalized patients with COVID-19, 57.5% were male and mean age was 49.1 years. Pooled data revealed that pharyngodynia was present in 12.4% of patients, nasal congestion in 3.7%, and rhinorrhea was rare. No reports on COVID-19 and olfactory/gustative disorders matched inclusion criteria but preliminary evidences suggested they could be present. Common symptoms were fever (85.6%), cough (68.7%), and fatigue (39.4%). Frequent comorbidities were hypertension (17.4%), diabetes (3.8%), and coronary heart disease (3.8%); 83% of patients had alterations on chest computed tomography that were bilateral in 89.5% of cases. Ground-glass opacity was the most common finding (50%). Lymphopenia (77.2%) and leucopenia (30.1%) were common. Critical cases with complications were 9%, intensive care unit admission was required in 7.3%, invasive ventilation in 3.4%, and mortality was 2.4%.CONCLUSIONOtolaryngologists should know that pharyngodynia, nasal congestion, olfactory, and gustative disorders could be the presenting symptoms of COVID-19. Clinical presentation together with radiological and laboratory findings could help to identify suspected cases.

6. Smell dysfunction: a biomarker for COVID-19.

Authors Moein, Shima T; Hashemian, Seyed M R; Mansourafshar, Babak; Khorram-Tousi, Ali; Tabarsi, Payam; Doty, Richard L
Source International forum of allergy & rhinology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32301284
Database Medline
 Available at [International forum of allergy & rhinology](#) from Wiley Online Library Medicine and Nursing Collection 2020
Abstract BACKGROUNDSARS-CoV-2, the virus that causes COVID-19 disease, is responsible for the largest pandemic since the 1918 H1N1 influenza outbreak. The symptoms presently recognized by the World Health Organization are cough, fever, tiredness, and difficulty breathing. Patient-reported smell and taste loss has been associated with COVID-19 infection, yet no empirical olfactory testing on a cohort of COVID-19 patients has been performed.METHODSThe University of Pennsylvania Smell Identification Test (UPSIT), a well-validated 40-odorant test, was administered to 60 confirmed COVID-19 inpatients and 60 age- and sex-matched controls to assess the magnitude and frequency of their olfactory dysfunction. A mixed effects analysis of variance determined whether meaningful differences in test scores existed between the two groups and if the test scores were differentially influenced by sex.RESULTSFifty-nine (98%) of the 60 patients exhibited some smell dysfunction [mean (95% CI) UPSIT score: 20.98 (19.47,22.48); controls: 34.10 (33.31,34.88); p<0.0001]. Thirty-five of the 60 patients (58%) were either anosmic (15/60; 25%) or severely microsmic (20/60; 33%); 16 exhibited moderate microsmia (16/60; 27%), 8 mild microsmia (8/60; 13%), and one normosmia (1/60; 2%). Deficits were evident for all 40 UPSIT odorants. No meaningful relationships between the test scores and sex, disease severity, or comorbidities were found.CONCLUSIONSQuantitative smell testing demonstrates that decreased smell function, but not always anosmia, is a major marker for SARS-CoV-2 infection and suggests the possibility that smell testing may help, in some cases, to identify COVID-19 patients in need of early treatment or quarantine. This article is protected by copyright. All rights reserved.

7. A primer on viral-associated olfactory loss in the era of COVID-19.

Authors Soler, Zachary M; Patel, Zara M; Turner, Justin H; Holbrook, Eric H
Source International forum of allergy & rhinology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article Review
PubMedID 32271490
Database Medline

Abstract

Available at [International forum of allergy & rhinology](#) from Wiley Online Library Medicine and Nursing Collection 2020

Early reports have suggested that smell loss may be an early symptom associated with the pandemic known as COVID-19. The possibility that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) might cause olfactory dysfunction is certainly plausible. Patients presenting to specialized smell clinics are commonly diagnosed with upper respiratory infection (URI)-associated olfactory loss and most are presumed to be viral related. In acute phases of infection, it is common to experience some smell loss as a result of nasal inflammation, mucosal edema, and obstruction of airflow into the olfactory cleft. In most cases, these episodes of smell loss are self-limiting and coincide with resolution of URI symptoms. However, in some cases the smell loss persists for months to years and this is presumed to occur through a more direct olfactory insult by the virus. It remains too early to know whether infection with SARS-CoV-2 causes persistent olfactory dysfunction. However, given the scale of this pandemic, if SARS-CoV-2 does cause chronic olfactory loss in even a small portion of those infected, then the overall population prevalence could be quite large. This review provides a brief, practical overview of viral-associated olfactory loss, realizing that evidence related to COVID-19 will likely not be clear for some time. Our goal is to highlight the existence and importance of this condition and provide information geared for both providers and patients. Practical suggestions regarding evaluation and treatment will be provided, realizing that there may be constraints on medical resources and the nature of this pandemic remains dynamic. This article is protected by copyright. All rights reserved.

8. Smell and taste dysfunction in patients with COVID-19.

Authors Xydakis, Michael S; Dehgani-Mobaraki, Puya; Holbrook, Eric H; Geisthoff, Urban W; Bauer, Christian; Hautefort, Charlotte; Herman, Philippe; Manley, Geoffrey T; Lyon, Dina M; Hopkins, Claire
Source The Lancet. Infectious diseases; Apr 2020
Publication Date Apr 2020
Publication Type(s) Letter
PubMedID 32304629
Database Medline

9. SARS-CoV-2: Olfaction, Brain Infection, and the Urgent Need for Clinical Samples Allowing Earlier Virus Detection.

Authors Butowt, Rafal; Bilinska, Katarzyna
Source ACS chemical neuroscience; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32283006
Database Medline

Abstract The novel SARS-CoV-2 virus has very high infectivity, which allows it to spread rapidly around the world. Attempts at slowing the pandemic at this stage depend on the number and quality of diagnostic tests performed. We propose that the olfactory epithelium from the nasal cavity may be a more appropriate tissue for detection of SARS-CoV-2 virus at the earliest stages, prior to onset of symptoms or even in asymptomatic people, as compared to commonly used sputum or nasopharyngeal swabs. Here we emphasize that the nasal cavity olfactory epithelium is the likely site of enhanced binding of SARS-CoV-2. Multiple non-neuronal cell types present in the olfactory epithelium express two host receptors, ACE2 and TMPRSS2 proteases, that facilitate SARS-CoV-2 binding, replication, and accumulation. This may be the underlying mechanism for the recently reported cases of smell dysfunction in patients with COVID-19. Moreover, the possibility of subsequent brain infection should be considered which begins in olfactory neurons. In addition, we discuss the possibility that olfactory receptor neurons may initiate rapid immune responses at early stages of the disease. We emphasize the need to undertake research focused on additional aspects of SARS-CoV-2 actions in the nervous system, especially in the olfactory pathway.

10. Features of anosmia in COVID-19.

Authors Klopfenstein, Timothée; Kadiane-Oussou, N'dri Juliette; Toko, Lynda; Royer, Pierre-Yves; Lepiller, Quentin; Gendrin, Vincent; Zayet, Souheil
Source Medecine et maladies infectieuses; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32305563
Database Medline

Abstract BACKGROUND Medical publications about anosmia with COVID-19 are scarce. We aimed to describe the prevalence and features of anosmia in COVID-19 patients. METHODS We retrospectively included COVID-19 patients with anosmia between March 1 and March 17, 2020. We used SARS-CoV-2 real time PCR in respiratory samples to confirm the cases. RESULTS Fifty-four of 114 patients (47%) with confirmed COVID-19 reported anosmia. Mean age of the 54 patients was 47 (± 16) years; 67% were females and 37% were hospitalized. The median Charlson comorbidity index was 0.70 (± 1.6 [0-7]). Forty-six patients (85%) had dysgeusia and 28% presented with pneumonia. Anosmia began 4.4 (± 1.9 [1-8]) days after infection onset. The mean duration of anosmia was 8.9 (± 6.3 [1-21]) days and 98% of patients recovered within 28 days. CONCLUSIONS Anosmia was present in half of our European COVID-19 patients and was often associated with dysgeusia.

11. Isolated sudden onset anosmia in COVID-19 infection. A novel syndrome?

Authors Gane, S B; Kelly, C; Hopkins, C
Source Rhinology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32240279
Database Medline
Abstract BACKGROUND The amelioration of the current COVID pandemic relies on swift and efficient case finding as well as stringent social distancing measures. Current advice suggests that fever or new onset dry cough are the commonest presenting complaints. METHODOLOGY We present a case report and case series as well as other evidence that there is an important fourth presenting syndrome, namely isolated sudden onset anosmia (ISOA), which should be considered highly suspicious for SARS-CoV-2. RESULTS A patient presenting with ISOA who went on to test positive for infection with COVID-19 and did not develop any further symptoms as well as a case series of similar patients although limited by the lack of reliable testing at the moment. CONCLUSIONS We posit the existence of a fourth common syndrome of COVID-19 infection: isolated sudden onset anosmia (ISOA) and urge the international community to consider this presentation in current management advice.

12. COVID-19 pandemic: Effects and evidence-based recommendations for otolaryngology and head and neck surgery practice.

Authors Kowalski, Luiz P; Sanabria, Alvaro; Ridge, John A; Ng, Wai Tong; de Bree, Remco; Rinaldo, Alessandra; Takes, Robert P; Mäkitie, Antti A; Carvalho, Andre L; Bradford, Carol R; Paleri, Vinidh; Hartl, Dana M; Vander Poorten, Vincent; Nixon, Iain J; Piazza, Cesare; Lacy, Peter; Rodrigo, Juan P; Guntinas-Lichius, Orlando; Mendenhall, William M; D'Cruz, Anil; Lee, Anne W M; Ferlito, Alfio
Source Head & neck; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32270581
Database Medline
Available at [Head & neck](#) from Wiley Online Library Medicine and Nursing Collection 2020

Abstract The 2019 novel coronavirus disease (COVID-19) is a highly contagious zoonosis produced by SARS-CoV-2 that is spread human-to-human by respiratory secretions. It was declared by the WHO as a public health emergency. The most susceptible populations, needing mechanical ventilation, are the elderly and people with associated comorbidities. There is an important risk of contagion for anesthetists, dentists, head and neck surgeons, maxillofacial surgeons, ophthalmologists, and otolaryngologists. Health workers represent between 3.8% and 20% of the infected population; some 15% will develop severe complaints and among them, many will lose their lives. A large number of patients do not have overt signs and symptoms (fever/respiratory), yet pose a real risk to surgeons (who should know this fact and must therefore apply respiratory protective strategies for all patients they encounter). All interventions that have the potential to aerosolize aerodigestive secretions should be avoided or used only when mandatory. Health workers who are: pregnant, over 55 to 65 years of age, with a history of chronic diseases (uncontrolled hypertension, diabetes mellitus, chronic obstructive pulmonary diseases, and all clinical scenarios where immunosuppression is feasible, including that induced to treat chronic inflammatory conditions and organ transplants) should avoid the clinical attention of a potentially infected patient. Health care facilities should prioritize urgent and emergency visits and procedures until the present condition stabilizes; truly elective care should cease and discussed on a case-by-case basis for patients with cancer. For those who are working with COVID-19 infected patients' isolation is compulsory in the following settings: (a) unprotected close contact with COVID-19 pneumonia patients; (b) onset of fever, cough, shortness of breath, and other symptoms (gastrointestinal complaints, anosmia, and dysgeusia have been reported in a minority of cases). For any care or intervention in the upper aerodigestive tract region, irrespective of the setting and a confirmed diagnosis (eg, rhinoscopy or flexible laryngoscopy in the outpatient setting and tracheostomy or rigid endoscopy under anesthesia), it is strongly recommended that all health care personnel wear personal protective equipment such as N95, gown, cap, eye protection, and gloves. The procedures described are essential in trying to maintain safety of health care workers during COVID-19 pandemic. In particular, otolaryngologists, head and neck, and maxillofacial surgeons are per se exposed to the greatest risk of infection while caring for COVID-19 positive subjects, and their protection should be considered a priority in the present circumstances.

13. Cerebellar Scholars' Challenging Time in COVID-19 Pandemia.

Authors Shaikh, Aasef G; Mitoma, Hiroshi; Manto, Mario
Source Cerebellum (London, England); Apr 2020
Publication Date Apr 2020
Publication Type(s) Editorial
PubMedID 32301047
Database Medline
Abstract Novel coronavirus, SARS-CoV2, has caused pandemic of highly contagious disease called coronavirus disease 2019 (COVID-19), with epicenters in China, Italy, Spain, and the USA. Primarily affecting the human respiratory system, SARS-CoV2 has some impact on the human brain, but apparently minimal on the cerebellum, at least so far. Neurological involvement in the acute phase appears to manifest with confusion, dizziness, impaired consciousness, propensity to develop acute strokes, anosmia, hypogeusia, ataxia, epilepsy, and neuralgia. Cerebellar scholars are facing a time of uncertainty. Telemedicine has suddenly emerged as an alternative to follow patients. There is an urgent need to develop novel platforms to assess and follow ataxic patients remotely, especially because cerebellar patients often require ambulatory care to maintain their autonomy.

14. Possible link between anosmia and COVID-19: sniffing out the truth.

Authors Marinosci, Annalisa; Landis, Basile N; Calmy, Alexandra
Source European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery; Apr 2020
Publication Date Apr 2020
Publication Type(s) Letter
PubMedID 32303881
Database Medline

15. Association of chemosensory dysfunction and Covid-19 in patients presenting with influenza-like symptoms

Authors Yan C.H.; Faraji F.; Prajapati D.P.; DeConde A.S.; Boone C.E.
Source International forum of allergy & rhinology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Article
PubMedID 32279441
Database EMBASE
Available at [International forum of allergy & rhinology](#) from Wiley Online Library Medicine and Nursing Collection 2020

Abstract BACKGROUND: Rapid spread of the SARS-CoV-2 virus and concern for viral transmission by ambulatory patients with minimal to no symptoms underline the importance of identifying early or subclinical symptoms of Covid-19 infection. Two such candidate symptoms include anecdotally reported loss of smell and taste. Understanding the timing and association of smell/taste loss in Covid-19 may help facilitate screening and early isolation of cases.

METHOD(S): A single-institution, cross-sectional study evaluating patient-reported symptoms with a focus on smell and taste was conducted using an internet-based platform on adult subjects who underwent testing for Covid-19. Logistic regression was employed to identify symptoms associated with Covid-19 positivity.

RESULT(S): A total of 1480 patients with influenza-like symptoms underwent Covid-19 testing between March 3 through 29, 2020. Our study captured 59 of 102 (58%) Covid-19-positive patients and 203 of 1378 (15%) Covid-19-negative patients. Smell and taste loss were reported in 68% (40/59) and 71% (42/59) of Covid-19-positive subjects, respectively, compared to 16% (33/203) and 17% (35/203) of Covid-19-negative patients ($p < 0.001$). Smell and taste impairment were independently and strongly associated with Covid-19-positivity (anosmia: adjusted odds ratio [aOR] 10.9, 95%CI:5.08-23.5; ageusia: aOR 10.2 95%CI:4.74-22.1); whereas, sore throat was associated with Covid-19-negativity (aOR 0.23, 95%CI:0.11-0.50). Of patients who reported Covid-19-associated loss of smell, 74% (28/38) reported resolution of anosmia with clinical resolution of illness.

CONCLUSION(S): In ambulatory individuals with influenza-like symptoms, chemosensory dysfunction was strongly associated with Covid-19 infection and should be considered when screening symptoms. Most will recover chemosensory function within weeks paralleling resolution of other disease-related symptoms. This article is protected by copyright. All rights reserved.

16. The use of google trends to investigate the loss of smell related searches during COVID-19 outbreak

Authors Walker A.; Hopkins C.; Surda P.
Source International forum of allergy & rhinology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Article
PubMedID 32279437
Database EMBASE
 Available at [International forum of allergy & rhinology](#) from Wiley Online Library Medicine and Nursing Collection 2020
 Available at [International forum of allergy & rhinology](#) from Unpaywall

Abstract BACKGROUND: Initial reports describing COVID-19 were dominated by the presence of cough, breathlessness, and fever, anecdotal reports suggested anosmia may also be a manifestation. We sought to use Google Trends (GT) to investigate whether there was a surge in individuals searching for information related to smell loss during the COVID-19 epidemic in the Italy, Spain, UK, USA, Germany, France, Iran and Netherlands.

METHOD(S): GT was used to explore Internet activity related to loss of smell in Italy, Spain, UK, USA, Germany, France, Iran and Netherlands. Spearman rank analysis was performed to correlate loss of smell relative search volumes (RSV) with the increases of daily confirmed cases of COVID-19 and deaths attributed to disease. As a control event, we also performed analysis of smell-related searches during the last UK Influenza epidemic of 2009.

RESULT(S): In all three countries, we observed strong correlations between daily RSVs related to loss of smell, increases of daily COVID-19+ cases and deaths ranging from 0.633 to 0.952. All correlations were statistically significant ($p < 0.05$).

CONCLUSION(S): There is a strong correlation between the frequency of searches for smell-related information and the onset of COVID-19 infection in Italy, Spain, UK, USA, Germany, France, Iran and Netherlands. We would hypothesise this may relate to a previously under-recognised symptom. This article is protected by copyright. All rights reserved.

17. Presentation of new onset anosmia during the COVID-19 pandemic

Authors Hopkins C.; Surda P.; Kumar N.
Source Rhinology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Article
PubMedID 32277751
Database EMBASE

Abstract INTRODUCTION: Anosmia has not been formally recognised as a symptom of COVID-19 infection. Growing anecdotal evidence suggests increasing incidence of cases of anosmia during the current pandemic, suggesting that COVID-19 may cause olfactory dysfunction. The objective was to characterise patients reporting new onset anosmia during the COVID-19 pandemic. METHODOLOGY: Design: Survey of 2428 patients reporting new onset anosmia during the COVID-19 pandemic. SETTING: Volunteer sample of patients seeking medical advice of recent onset self-diagnosed loss of sense of smell RESULTS: 2428 surveys were completed within 7 days; 64% respondents were under 40. The majority of respondents reported onset of their anosmia in the last week. Of the cohort, 17% did not report any other symptom thought to be associated with COVID-19. In patients who reported other symptoms, 51% reported either cough or fever and therefore met current guidelines for self-isolation. CONCLUSION(S): Anosmia is reported in conjunction with well-reported symptoms of coronas virus, but 1 in 6 patients with recent onset anosmia report this as an isolated symptom. This might help identify otherwise asymptomatic carriers of disease and trigger targeted testing. Further study with COVID-19 testing is required to identify the proportion of patients in whom new onset anosmia can be attributed to COVID-19.

18. Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China

Authors Mao L.; Jin H.; Wang M.; Chen S.; He Q.; Hong C.; Zhou Y.; Li Y.; Hu B.; Hu Y.; Chang J.; Miao X.; Wang D.
Source JAMA neurology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Article
PubMedID 32275288
Database EMBASE
Available at [JAMA neurology](#) from Unpaywall
Abstract Importance: The outbreak of coronavirus disease 2019 (COVID-19) in Wuhan, China, is serious and has the potential to become an epidemic worldwide. Several studies have described typical clinical manifestations including fever, cough, diarrhea, and fatigue. However, to our knowledge, it has not been reported that patients with COVID-19 had any neurologic manifestations. Objective(s): To study the neurologic manifestations of patients with COVID-19. Design, Setting, and Participant(s): This is a retrospective, observational case series. Data were collected from January 16, 2020, to February 19, 2020, at 3 designated special care centers for COVID-19 (Main District, West Branch, and Tumor Center) of the Union Hospital of Huazhong University of Science and Technology in Wuhan, China. The study included 214 consecutive hospitalized patients with laboratory-confirmed diagnosis of severe acute respiratory syndrome coronavirus 2 infection. Main Outcomes and Measures: Clinical data were extracted from electronic medical records, and data of all neurologic symptoms were checked by 2 trained neurologists. Neurologic manifestations fell into 3 categories: central nervous system manifestations (dizziness, headache, impaired consciousness, acute cerebrovascular disease, ataxia, and seizure), peripheral nervous system manifestations (taste impairment, smell impairment, vision impairment, and nerve pain), and skeletal muscular injury manifestations. Result(s): Of 214 patients (mean [SD] age, 52.7 [15.5] years; 87 men [40.7%]) with COVID-19, 126 patients (58.9%) had nonsevere infection and 88 patients (41.1%) had severe infection according to their respiratory status. Overall, 78 patients (36.4%) had neurologic manifestations. Compared with patients with nonsevere infection, patients with severe infection were older, had more underlying disorders, especially hypertension, and showed fewer typical symptoms of COVID-19, such as fever and cough. Patients with more severe infection had neurologic manifestations, such as acute cerebrovascular diseases (5 [5.7%] vs 1 [0.8%]), impaired consciousness (13 [14.8%] vs 3 [2.4%]), and skeletal muscle injury (17 [19.3%] vs 6 [4.8%]). Conclusions and Relevance: Patients with COVID-19 commonly have neurologic manifestations. During the epidemic period of COVID-19, when seeing patients with neurologic manifestations, clinicians should suspect severe acute respiratory syndrome coronavirus 2 infection as a differential diagnosis to avoid delayed diagnosis or misdiagnosis and lose the chance to treat and prevent further transmission.

19. Olfactory and gustatory dysfunctions as a clinical presentation of mild-to-moderate forms of the coronavirus disease (COVID-19): a multicenter European study

Authors Lechien J.R.; Chiesa-Estomba C.M.; De Siati D.R.; El Afia F.; Distinguin L.; Chekkoury-Idrissi Y.; Delgado I.L.; Calvo-Henriquez C.; Lavigne P.; Falanga C.; Barillari M.R.; Cammaroto G.; Hsieh J.; Fakhry N.; Ayad T.; Saussez S.; Journe F.; Hans S.; Horoi M.; Le Bon S.D.; Rodriguez A.; Dequanter D.; Blecic S.; Khalife M.; Leich P.; Souchay C.; Rossi C.; Edjlali M.; Carlier R.; Ris L.; Lovato A.; De Filippis C.; Coppee F.
Source European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery; Apr 2020
Publication Date Apr 2020
Publication Type(s) Article
PubMedID 32253535
Database EMBASE

Abstract

Available at [European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies \(EUFOS\) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery](#) from Unpaywall

OBJECTIVE: To investigate the occurrence of olfactory and gustatory dysfunctions in patients with laboratory-confirmed COVID-19 infection.

METHOD(S): Patients with laboratory-confirmed COVID-19 infection were recruited from 12 European hospitals. The following epidemiological and clinical outcomes have been studied: age, sex, ethnicity, comorbidities, and general and otolaryngological symptoms. Patients completed olfactory and gustatory questionnaires based on the smell and taste component of the National Health and Nutrition Examination Survey, and the short version of the Questionnaire of Olfactory Disorders-Negative Statements (sQOD-NS).

RESULT(S): A total of 417 mild-to-moderate COVID-19 patients completed the study (263 females). The most prevalent general symptoms consisted of cough, myalgia, and loss of appetite. Face pain and nasal obstruction were the most disease-related otolaryngological symptoms. 85.6% and 88.0% of patients reported olfactory and gustatory dysfunctions, respectively. There was a significant association between both disorders ($p < 0.001$). Olfactory dysfunction (OD) appeared before the other symptoms in 11.8% of cases. The sQO-NS scores were significantly lower in patients with anosmia compared with normosmic or hyposmic individuals ($p = 0.001$). Among the 18.2% of patients without nasal obstruction or rhinorrhea, 79.7% were hyposmic or anosmic. The early olfactory recovery rate was 44.0%. Females were significantly more affected by olfactory and gustatory dysfunctions than males ($p = 0.001$).

CONCLUSION(S): Olfactory and gustatory disorders are prevalent symptoms in European COVID-19 patients, who may not have nasal symptoms. The sudden anosmia or ageusia need to be recognized by the international scientific community as important symptoms of the COVID-19 infection.

20. Sudden and Complete Olfactory Loss Function as a Possible Symptom of COVID-19

Authors Eliezer M.; Houdart E.; Hautefort C.; Hamel A.-L.; Verillaud B.; Herman P.; Eloit C.
Source JAMA otolaryngology-- head & neck surgery; Apr 2020
Publication Date Apr 2020
Publication Type(s) Article
PubMedID 32267483
Database EMBASE
Available at [JAMA otolaryngology-- head & neck surgery](#) from Unpaywall

21. Causes of hyposmia/hyposmia in SARS-CoV2 infected patients.

Authors Finsterer J; Stollberger C
Source Journal of medical virology; Apr 2020
Publication Date Apr 2020
Publication Type(s) Letter
PubMedID 32311107
Database PubMed
Available at [Journal of Medical Virology](#) from Wiley Online Library Medicine and Nursing Collection 2020
Abstract It is well appreciated that SARS-CoV2 does not exclusively affect the lungs.^{1,2} Virus-RNA can be detected in most of the body compartments, including the cerebrospinal fluid (CSF).³ Neurological manifestations have been recently investigated in a retrospective study of 214 SARS-CoV2-infected patients.¹ This article is protected by copyright. All rights reserved.

22. COVID-19 in otolaryngologist practice: a review of current knowledge.

Authors Krajewska J; Krajewski W; Zub K; Zatoński T
Source European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article; Review
PubMedID 32306118
Database PubMed

Abstract **PURPOSE:** Otorhinolaryngological manifestations are common symptoms of COVID-19. This study provides a brief and precise review of the current knowledge regarding COVID-19, including disease transmission, clinical characteristics, diagnosis, and potential treatment. The article focused on COVID-19-related information useful in otolaryngologist practice.
METHODS: The Medline and Web of Science databases were searched without a time limit using terms "COVID-19", "SARS-CoV-2" in conjunction with "otorhinolaryngological manifestation", "ENT", and "olfaction".
RESULTS: The most common otolaryngological dysfunctions of COVID-19 were cough, sore throat, and dyspnea. Rhinorrhea, nasal congestion and dizziness were also present. COVID-19 could manifest as an isolated sudden hyposmia/anosmia. Upper respiratory tract (URT) symptoms were commonly observed in younger patients and usually appeared initially. They could be present even before the molecular confirmation of SARS-CoV-2. Otolaryngologists are at great risk of becoming infected with SARS-CoV-2 as they cope with URT. ENT surgeons could be easily infected by SARS-CoV-2 during performing surgery in COVID-19 patients.
CONCLUSION: Ear, nose and throat (ENT) symptoms may precede the development of severe COVID-19. During COVID-19 pandemic, patients with cough, sore throat, dyspnea, hyposmia/anosmia and a history of travel to the region with confirmed COVID-19 patients, should be considered as potential COVID-19 cases. An otolaryngologist should wear FFP3/N95 mask, glasses, disposable and fluid resistant gloves and gown while examining such individuals. Not urgent ENT surgeries should be postponed. Additional studies analyzing why some patients develop ENT symptoms during COVID-19 and others do not are needed. Further research is needed to determine the mechanism leading to anosmia.

23. Utility of hyposmia and hypogeusia for the diagnosis of COVID-19.

Authors Bénézit F; Le Turnier P; Declerck C; Paillé C; Revest M; Dubée V; Tattevin P; RAN COVID Study Group
Source The Lancet. Infectious diseases; Apr 2020
Publication Date Apr 2020
Publication Type(s) Letter
PubMedID 32304632
Database PubMed

24. Anosmia in a healthcare worker with COVID-19 in Madrid, Spain.

Authors Ollarves-Carrero MF; Rodriguez-Morales AG; Bonilla-Aldana DK; Rodriguez-Morales AJ
Source Travel medicine and infectious disease; Apr 2020 ; p. 101666
Publication Date Apr 2020
Publication Type(s) Letter
PubMedID 32298782
Database PubMed
Available at [Travel medicine and infectious disease](#) from Unpaywall

25. Urticarial eruption in COVID-19 infection.

Authors Henry D; Ackerman M; Sancelme E; Finon A; Esteve E
Source Journal of the European Academy of Dermatology and Venereology : JEADV; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32294273
Database PubMed
Available at [Journal of the European Academy of Dermatology and Venereology : JEADV](#) from Wiley Online Library Medicine and Nursing Collection 2020

Abstract Coronavirus disease (COVID-19) is spreading quickly across the world, until a pandemic condition was announced by the WHO on March. Many clinical manifestations of this virus are described and new symptoms are emerging particularly outside respiratory sphere, such as anosmia and ageusia which are recent ORL published symptoms. About skin manifestation, few cases of rashes on patients with laboratory-confirmed Covid-19 were described in two Chinese cohorts.

26. Anosmia and Ageusia: Common Findings in COVID-19 Patients.

Authors Vaira LA; Salzano G; Deiana G; De Riu G
Source The Laryngoscope; Apr 2020
Publication Date Apr 2020
Publication Type(s) Journal Article
PubMedID 32237238
Database PubMed

Abstract Available at [The Laryngoscope](#) from Wiley Online Library Medicine and Nursing Collection 2020
In a not negligible number of patients affected by COVID-19 (coronavirus disease 2019), especially if paucisymptomatic, anosmia and ageusia can represent the first or only symptomatology present. Laryngoscope, 2020.

27. [The Covid-19 pandemic and otolaryngology: What it comes down to?]

Authors Lüers, Jan-Christoffer; Klußmann, Jens Peter; Guntinas-Lichius, Orlando
Source Laryngo- rhino- otologie; Mar 2020
Publication Date Mar 2020
Publication Type(s) English Abstract Journal Article
PubMedID 32215896
Database Medline
 Available at [Laryngo- rhino- otologie](#) from Unpaywall
Abstract Here, we review the most recent findings on the effects COVID-19 pandemic for the work of otolaryngologists. The role of anosmia and hyposmia as a potential COVID-19 related symptom is presented. We discuss the clinical management of all ENT patients, but especially of COVID-19 patients from the ENT perspective. The impact of the infection on the ENT examination and ENT surgery is summarized.

28. Identification of viruses in patients with postviral olfactory dysfunction.

Authors Suzuki, Motohiko; Saito, Koichi; Min, Wei-Ping; Vladau, Costin; Toida, Kazunori; Itoh, Hirotaka; Murakami, Shingo
Source The Laryngoscope; Feb 2007; vol. 117 (no. 2); p. 272-277
Publication Date Feb 2007
Publication Type(s) Journal Article
PubMedID 17277621
Database Medline
 Available at [The Laryngoscope](#) from Wiley Online Library Medicine and Nursing Collection 2020
 Available at [The Laryngoscope](#) from Unpaywall
Abstract OBJECTIVE Causative viruses of postviral olfactory dysfunction (PVOD) have not yet been identified. The aim of this study was to investigate causative viruses in patients with PVOD. STUDY DESIGN AND METHODS Nasal discharge was collected from 24 patients with PVOD. We investigated the presence of 10 viruses in nasal discharge and examined the time course, with regard to changes in olfactory dysfunction and nasal obstruction in patients with PVOD, using questionnaires, acoustic rhinometry, and olfactory tests. RESULTS Rhinoviruses were detected in 10 patients by electrophoresis. Rhinoviruses were also confirmed in four patients by nucleotide sequences. Viral serotypes were identified to be human rhinovirus (HRV)-40, HRV-75, HRV-78, and HRV-80. One of the four patients complained of anosmia, whereas another complained of dysosmia. Olfactory testing did not show significant improvement at 4, 8, 11, and 24 weeks after the first visit in the four patients, although results of acoustic rhinometry significantly improved. Two of the four patients complained of olfactory dysfunction even 6 months after the first visit. Coronavirus and parainfluenza virus were detected in one patient each, and Epstein-Barr viruses were detected in three patients. CONCLUSION This study for the first time detected rhinovirus, coronavirus, parainfluenza virus, and Epstein-Barr virus in nasal discharge of patients with PVOD. Furthermore, the present study suggests that rhinoviruses can cause olfactory dysfunction through mechanisms other than nasal obstruction and that rhinoviruses can induce various severities and different time courses of olfactory dysfunction.

29. Olfactory neuropathy in severe acute respiratory syndrome: report of A case.

Authors Hwang, Chi-Shin
Source Acta neurologica Taiwanica; Mar 2006; vol. 15 (no. 1); p. 26-28
Publication Date Mar 2006
Publication Type(s) Case Reports Journal Article
PubMedID 16599281
Database Medline
Abstract This case was a 27 years old female with severe acute respiratory syndrome (SARS). She suffered from typical symptoms of SARS. Although she got almost complete recovery from most symptoms after treatment, she noted acute onset complete anosmia 3 weeks after the onset of her first symptom. Her brain MRI examination did not show definite lesion except an incidental finding of left temporal epidermoid cyst. Her anosmia persisted for more than 2 years during following up. Peripheral neuropathy and myopathy have been reported as a concomitant problem during the convalescent stage of SARS, while the sequel of permanent anosmia in SARS was not reported before. Olfactory neuropathy, which rarely occurred in typical peripheral neuropathy, could be a special type of neuropathy induced by corona virus infection in SARS. Olfactory function test should be taken into routine check-up for patients with SARS. The pathophysiology and therapeutic strategy of this special type of permanent olfactory dysfunction deserve further investigation.

Strategy 841090

#	Database	Search term	Results
1	Medline	(corona).ti,ab	6603
2	Medline	("corona virus*").ti,ab	349
3	Medline	("COVID-19").ti,ab	4515
4	Medline	(coronavirus).ti,ab	12285
5	Medline	CORONAVIRUS/	1994
6	Medline	(1 OR 2 OR 3 OR 4 OR 5)	21906
7	Medline	("loss of smell").ti,ab	173
8	Medline	("sense of smell").ti,ab	1354
9	Medline	(smell*).ti,ab	9133
10	Medline	"OLFACTION DISORDERS"/	4030
11	Medline	SMELL/	15503
12	Medline	(7 OR 8 OR 9 OR 10 OR 11)	23774
13	Medline	(6 AND 12)	16
14	Medline	(anosmia).ti,ab	2003
15	Medline	(6 AND 14)	21
16	Medline	15 not 13	14
17	EMBASE	(coronavirus).ti,ab	12587
18	EMBASE	"CORONAVIRUS INFECTION"/	2517
19	EMBASE	CORONAVIRUS/	6844
20	EMBASE	CORONAVIRINAE/	1819
21	EMBASE	("corona virus").ti,ab	357
22	EMBASE	("COVID-19").ti,ab	3316
23	EMBASE	(corona).ti,ab	7732

24	EMBASE	(17 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23)	25560
25	EMBASE	(smell).ti,ab	10365
26	EMBASE	(anosmia).ti,ab	2691
27	EMBASE	ANOSMIA/	3714
28	EMBASE	"SMELLING SENSITIVITY"/	5274
29	EMBASE	"SMELLING DISORDER"/	3452
30	EMBASE	"SMELLING DEPRIVATION"/	3714
31	EMBASE	SMELLING/	11267
32	EMBASE	(smell*).ti,ab	13433
33	EMBASE	(25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32)	29565
34	EMBASE	(24 AND 33)	30
35	PubMed	(coronavirus).ti,ab	18619
36	PubMed	("COVID-19").ti,ab	5377
37	PubMed	(COVID).ti,ab	5414
38	PubMed	(COVID*).ti,ab	6458
39	PubMed	(corona).ti,ab	9755
40	PubMed	(CORVID*).ti,ab	552
41	PubMed	(35 OR 36 OR 37 OR 38 OR 39 OR 40)	32030
42	PubMed	(smell*).ti,ab	23246
43	PubMed	(olfact*).ti,ab	54372
44	PubMed	(anosmia).ti,ab	5611
45	PubMed	(42 OR 43 OR 44)	64648
46	PubMed	(41 AND 45)	102
47	PubMed	(hyposmia).ti,ab	1248
48	PubMed	(microsmia).ti,ab	29
49	PubMed	(45 OR 47 OR 48)	64919

50	PubMed	(41 AND 49)	103
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