COVID-19 Anosmia Reporting Tool: Initial Findings

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Abstract

There is accumulating anecdotal evidence that anosmia and dysgeusia are associated with the COVID-19 pandemic. In order to investigate their relationship to SARS-CoV2 infection, the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) developed the COVID-19 Anosmia Reporting Tool for Clinicians for the basis of this pilot study. This tool allows healthcare providers to confidentially submit cases of anosmia and dysgeusia related to COVID-19. We analyzed the first 237 entries which revealed that anosmia was noted in 73% of subjects prior to COVID-19 diagnosis and was the initial symptom in 26.6%. Some improvement was noted in 27% of patients, with mean time to improvement of 7.2 days in this group (85% of this group improved within 10 days). Our findings suggest that anosmia can be a presenting symptom of COVID-19, consistent with other emerging international reports. Anosmia may be critical in timely identification of individuals infected with SARS-CoV2 who may unwittingly be transmitting the virus.
Anosmia (loss of sense of smell) and dysgeusia (alteration of sense of taste) have been reported in association with the COVID-19 pandemic. Dysgeusia may be related to alteration in the perception of taste due to loss of the sense of olfaction. There have been published and non-published anecdotal reports of anosmia related to COVID-19 emanating from around the world, including South Korea, Germany, Italy, United Kingdom, Iran and the United States. In South Korea, the Daegu City Council’s informal phone survey found 15.3% of 3191 confirmed SARS-CoV-2 cases had anosmia or dysgeusia.\(^1\) Hendrick Streeck, a German virologist, reported a loss of smell and taste in over two-thirds of 100 COVID-19 positive people interviewed with mild symptoms.\(^2\) Massimo Galli, an Italian infectious disease specialist at the University of Milan, noted that anosmia and dysgeusia seems to be observed in patients even with modest symptoms or limited severity, however, they appear to present later in the course of infection.\(^3\) A non-peer reviewed Iranian study\(^4\) on 10,069 subjects with anosmia or hyposmia (unknown COVID-19 status) noted sudden symptom onset in 76.2%.

In an effort to establish a platform allowing healthcare providers of all specialties worldwide to submit data to confidentially report on anosmia symptoms related to COVID-19, the American Academy of Otolaryngology—Head and Neck Surgery (AAO-HNS) established the COVID-19 Anosmia Reporting Tool for Clinicians (Supplement Data 1).\(^5\) The survey was developed by expert panelists and stakeholders from the AAO-HNS Infectious Disease and Patient Safety Quality Improvement Committees. After multiple iterations, consensus was reached, satisfying adequate face validity. The content of the tool, especially the data elements, was based on review of multiple
COVID-19 reports related to anosmia. As this is a pilot study conducted in an expedited manner to address the rapidly changing situation, additional validation will be forthcoming. Data collection is hosted on a platform similarly used for the AAO-HNS Patient Safety Event Reporting Tool, with digital safeguards built to ensure anonymity. No identifiable data about the user was solicited. Computer's IP address was not captured from the submitting provider to preserve the confidentiality of the report/reporter. If identifiable information was inadvertently provided by the reporter in the free-text entry boxes, this information was immediately discarded. This preliminary analysis is based on data collected from the opening of the survey March 25, 2020 to April 3, 2020. Descriptive statistics were used to describe submissions to the database.

In 10 days of data accrual, 240 entries were made. Three were removed due to clinical inconsistencies and thus 237 entries were analyzed. While otolaryngologists contributed 47% of entries, the majority came from a variety of other specialists (Figure 1). Demographics are shown in Table 1. Age distribution histogram is found in Appendix 1. Over one-third of the cases were of healthcare workers.

One of the most relevant findings is the timing of anosmia in relationship to diagnosis and the presence—or absence—of other symptoms (Table 2). Anosmia was noted in 73% prior to diagnosis. Anosmia contributed to recommending testing in 40%. More critically, anosmia was the initial symptom in more than a quarter of patients. The remainder demonstrated more common symptoms of COVID-19, with myalgias and sore throat highly noted as free-text entries in the “Other” category. Some improvement in anosmia was noted in 27% of patients, with mean time to improvement of 7.2 days in
this group (85% of this group improved within 10 days). This data is subject to
significant interpretation as many entries were submitted before long-term follow up was
achieved.

Although the exact pathophysiology of how SARS-CoV-2 could produce olfactory
dysfunction has not been firmly established, direct extension through the nasal mucosa
(via angiotensin-converting enzyme 2 receptor on the basal layer of the nasal
epithelium) and/or extension to the olfactory bulb are potential hypotheses. Post-viral
olfactory dysfunction is a common cause of olfactory dysfunction and is thought to be
caused by neuroepithelial dysfunction. 7,8 Deems et al6 reported 26% of patients had
anosmia as a result of an upper respiratory infection or cold, with a preponderance of
females (63%) being affected more than males. More recently, Fornazieri et al9 reported
a 13% incidence of post-viral loss of smell.

Although coronaviruses are a known etiology for post-viral olfactory dysfunction,10 there
is only one case report of SARS-CoV producing anosmia.11 SARS-CoV-2 appears to
differ in this regard, as the mounting anecdotal evidence caused ENT UK and the AAO-
HNS to announce the potential association.12,13 For the current COVID-19 pandemic,
scientific data is emerging. A European multi-center study released recently had 417
COVID-19 patients with mild-to-moderate symptoms (mean age = 36.9 years; 263
(63%) female).14 Olfactory dysfunction was reported in 11.8% of cases before any other
symptom.
Currently, neither the WHO nor the CDC recognize anosmia as a screening symptom. As we continue to treat this pandemic, it is vital to identify additional symptoms outside of the classic triad of fever, cough, and dyspnea in an effort to promote timely identification of infected individuals who may unknowingly transmit the virus. Characteristic symptoms inclusive of anosmia can be utilized to direct early and widespread testing to mitigate this disease.

With this survey, some caveats should be considered. Entries are provider initiated and limited by the awareness of the tool. Because of limitations to testing availability, diagnosis of some patients is presumed and not confirmed. By the nature of the capture strategy, analysis has been made of a subset of COVID-19 patients only: those that have anosmia. It is difficult to determine the prevalence of this symptom among all COVID-19 patients.

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<thead>
<tr>
<th>Demographics, n=237</th>
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<tbody>
<tr>
<td><strong>Age, y</strong></td>
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<tr>
<td>Mean (±SD)</td>
</tr>
<tr>
<td>Median</td>
</tr>
<tr>
<td>Range</td>
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<tr>
<td><strong>Sex, M/F (%)</strong></td>
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<tr>
<td>108/129 (46/54)</td>
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<tr>
<td><strong>Patient location (%)</strong></td>
</tr>
<tr>
<td>United States</td>
</tr>
<tr>
<td>Mexico</td>
</tr>
<tr>
<td>Italy</td>
</tr>
<tr>
<td>UK</td>
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<tr>
<td>Other</td>
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Table 2. Timing of Anosmia

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<tr>
<th>Timing of Anosmia</th>
<th>Anosmia onset (%)</th>
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<tbody>
<tr>
<td>Before diagnosis</td>
<td><strong>172 (73)</strong></td>
</tr>
<tr>
<td>Anosmia contributed to testing for COVID-19</td>
<td>94 (40)</td>
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<tr>
<td>After diagnosis</td>
<td>65 (27)</td>
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<tr>
<th>Symptoms before anosmia (%)</th>
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<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Fever</td>
</tr>
<tr>
<td>Chills</td>
</tr>
<tr>
<td>Malaise</td>
</tr>
<tr>
<td>Cough</td>
</tr>
<tr>
<td>Headache</td>
</tr>
<tr>
<td>Nasal congestion</td>
</tr>
<tr>
<td>Rhinorrhea</td>
</tr>
<tr>
<td>GI distress</td>
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<tr>
<td>Other</td>
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<th>Resolution of Anosmia (%)</th>
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<tbody>
<tr>
<td>Complete resolution</td>
</tr>
<tr>
<td>Partial resolution</td>
</tr>
<tr>
<td>None, not yet</td>
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</tbody>
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<table>
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<th>Mean time to improvement, d (±SD)</th>
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<td>7.2 (±3.1)</td>
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References


Figure 1. Sources of Data.


Supplement Data 2. Age Distribution of Patients
Figure 1

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SOURCE OF DATA

- **Otolaryngology**: 47%
- **Other**: 21%
- **Family Practice**: 13%
- **Emergency Medicine**: 5%
- **Pediatrics**: 2%
- **Patient**: 2%
- **Infectious Disease**: 1%
- **Pulmonology**: 1%
- **Internal Medicine**: 8%
COVID-19 Anosmia Reporting Tool

There is rapidly accumulating anecdotal evidence that anosmia with resultant dysgeusia are frequently reported symptoms associated with the COVID-19 pandemic. Similar reports are surfacing from multiple countries around the world including the United States. In an effort to establish the importance of these symptoms in diagnosis and progression of COVID-19, the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) has established an Anosmia Reporting Tool. This tool was developed by the AAO-HNS Infectious Disease and Patient Safety Quality Improvement Committees to allow healthcare providers of all specialties worldwide to submit data to confidentially report on anosmia and dysgeusia related to COVID-19.

There are safeguards to ensure the confidentiality of reporting. No identifiable data about the user is submitted with the report and the computer’s IP address is not captured from the submitting provider to preserve the confidentiality of the report/reporter. Further, any report containing identifiable information (hospital name, location, practice name, etc.) is immediately discarded.

To maintain confidentiality, this report needs to be completed online. However, for your convenience, you may view the questions and download a pdf of the Anosmia Reporting Tool below:

Instructions:

- Please respond to as many questions as possible
- Do not report any information that may identify the physician, patient or institution in the questions with the free text boxes
- No identifiable information is collected from the submitting provider
- Once your data is submitted, an email will be sent to AAO-HNS staff notifying them of the new submission

You may contact the AAO-HNS research business unit regarding the Anosmia Reporting Tool at Anomsia@entnet.org

COVID-19 ANOSMIA REPORTING TOOL

1. Medical Specialty of Submitting Provider: (free text) ____________________

2. Patient age: ____ (Only enter a number)

3. Patient Gender:                               ___ Male  ____Female

4. Patient location at time of diagnosis
   ___ United States
   ___ Other
   4a. If Other, please specify country: (free text) __________________________________________

5. Is the source of the COVID-19 infection identifiable? ___Yes ___No
5a. If “yes,” how many days from the contact was the anosmia/dysgeusia first observed? ____

6. Please list any risk factors for COVID-19 infection present:
   ___ None
   ___ Healthcare worker
   ___ First Responder
   ___ Close contact with a confirmed case
   ___ Homeless
   ___ Congregant living (dorms, fraternities/sororities, shelters, jail, prison, skilled nursing, assisted living, adult family home)
   ___ Travel to known areas with widespread community transmission
   ___ Other
   6a. if “Other,” please specify risk factors: (free text) ______________________

7. Other risk factors/comorbidities:
   ___ None
   ___ Smoking
   ___ Head trauma
   ___ Sinusitis/allergy
   ___ Chronic respiratory disease/Asthma
   ___ Cardiac disease
   ___ Neurologic disease (e.g. Parkinson’s)
   ___ Other
   7a. If “Other,” please specify risk factors/comorbidities: (free text)______________

8. When was the anosmia (loss of sense of smell) or dysgeusia (alteration of sense of taste) first noticed by the patient?
   ___ Before diagnosis _____ After diagnoses

   8a. If “before diagnosis,” was the anosmia part of the reason for the testing for SARS-CoV2?
      ___ Yes
      ___ No

   8b. If “after diagnosis”: how many days from diagnosis? ____

9. Did the patient have any other symptoms BEFORE the development of anosmia/dysgeusia? Check all that apply
   ___ None
   ___ Fever
   ___ Chills
   ___ Malaise
   ___ Cough
   ___ Headache
   ___ Nasal Congestion
   ___ Rhinorrhea
   ___ Gastrointestinal Distress
9a. If “Other,” please provide detail: (free text) ____________________________

10. What symptoms did the patient have AT THE TIME of anosmia/dysgeusia?
   ____ None
   ____ Fever
   ____ Chills
   ____ Malaise
   ____ Cough
   ____ Headache
   ____ Nasal Congestion
   ____ Rhinorrhea
   ____ Gastrointestinal Distress
   ____ Other
10a. If “Other,” please provide detail: (free text) ____________________________

11. What was the condition of the COVID-19 infection at the time the anosmia/dysgeusia was observed?
   ____ Inpatient/hospitalized
   ____ Outpatient

12. Did the patient’s condition worsen or improve after the anosmia/dysgeusia was observed?
   ____ Worsen
   ____ Improve

13. What is the patient’s current COVID-19 infection status
   ____ Active
   ____ Recovered
   ____ Deceased

14. Did the anosmia/dysgeusia resolve?
   ____ Yes
   ____ No

   If “Yes” to above:
   14a. How long after the anosmia/dysgeusia was observed: (free text) ____________
   14b. Was it:
   ____ Complete resolution
   ____ Partial Resolution

15. Did the patient receive treatments for the anosmia?
   ____ Yes
   ____ No

   If “Yes” to above:
15a. What treatments if any did the patient receive?

15b. How soon after did the anosmia/dysgeusia resolve:

17. Comments/Additional information: (free text)____________________________________