Many hospitals have implemented admission SARS-CoV-2 testing to evaluate the need for transmission-based precautions.

A positive test in an asymptomatic patient may represent:
1. Active infection, signifying infectiousness.
2. False positivity.
3. Past infection with prolonged viral shedding, indicating non-infectiousness.
4. We used a strand-specific SARS-CoV-2 real-time reverse polymerase chain reaction (rRT-PCR) to assess infectivity among asymptomatic patients with a positive SARS-CoV-2 PCR admission test.
5. A positive minus strand PCR signified ongoing viral replication.

Objectives

- Identify the need for admission testing for asymptomatic patients.
- Describe the characteristics of asymptomatic patients who had a positive SARS-CoV-2 PCR with negative minus strand within 2 days of admission.

Methods

- We used a 2-step rRT-PCR specific to the minus strand of the SARS-CoV-2 envelope gene.
- We reviewed records of patients with a positive SARS-CoV-2 PCR who were also tested for the strand-specific SARS-CoV-2 PCR within two days of admission at Stanford Health Care during July 2020–April 2022.
- We restricted our analysis to each patient’s first test. We calculated the percent of detectable minus strand-specific tests among asymptomatic patients over time and performed descriptive statistics for age, sex, immunocompromising state.

Patient and test characteristics

- A total of 848 admitted patients had strand-specific SARS-CoV-2 assays performed.
- Out of 532 patients with a strand-specific assay done within 2 days of admission, 242 (45%) were asymptomatic.
- Among asymptomatic patients, the mean age was 58 years (range: 19-99 years), 133 were male (59%), 51 had immunocompromising conditions (21%), and 30 were admitted for a surgical procedure (12%).
- Among the 50 tests sent on immunocompromised patients, immunosuppressive conditions were as follows:
  - Solid organ transplant: 12 tests (24%)
  - CAR-T, BMT, or active chemotherapy: 15 tests (30%)
  - Biologic agents or steroids: 4 tests (8%)
  - HIV/AIDS, Primary immunodeficiency, other immunosuppressive conditions: 19 tests (38%)
- A total of 21 had detectable minus strand-specific assays (9%, range: 4-25% per quarter).

Table 1. Percent positivity of asymptomatic tests done within 2 days of admission per quarter

<table>
<thead>
<tr>
<th>Asymptomatic tests/quarter</th>
<th>Minus strand percent positivity</th>
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</thead>
<tbody>
<tr>
<td>August 2020-October 2020</td>
<td>4%</td>
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<tr>
<td>November 2020-January 2021</td>
<td>4%</td>
</tr>
<tr>
<td>February 2021-April 2021</td>
<td>4%</td>
</tr>
<tr>
<td>May 2021-July 2021</td>
<td>5%</td>
</tr>
<tr>
<td>August 2021-October 2021</td>
<td>17%</td>
</tr>
<tr>
<td>November 2021-January 2022</td>
<td>25%</td>
</tr>
<tr>
<td>February 2022-April 2022</td>
<td>5%</td>
</tr>
</tbody>
</table>

Discussion

- The majority of patients with positive SARS-CoV-2 PCRs on admission were found to be non-infectious based on strand-specific rRT-PCR testing.
- Only 4-25% of asymptomatic inpatients had a detectable minus strand.
- Our findings agree with prior studies which have identified persistently positive SARS-CoV-2 PCRs without the presence of culturable live virus.
- Positive SARS-CoV-2 PCR in asymptomatic individuals often leads to delays in medical care, highlighting the importance of confirming infectiousness.

Conclusion(s)

- Most asymptomatic patients tested for SARS-CoV-2 on admission were not infectious.
- Hospitals using SARS-CoV-2 PCR admission testing may need to reevaluate the continued use of this practice.