Risk Assessment for COVID-19 Infection using Non-Contact Tonometer

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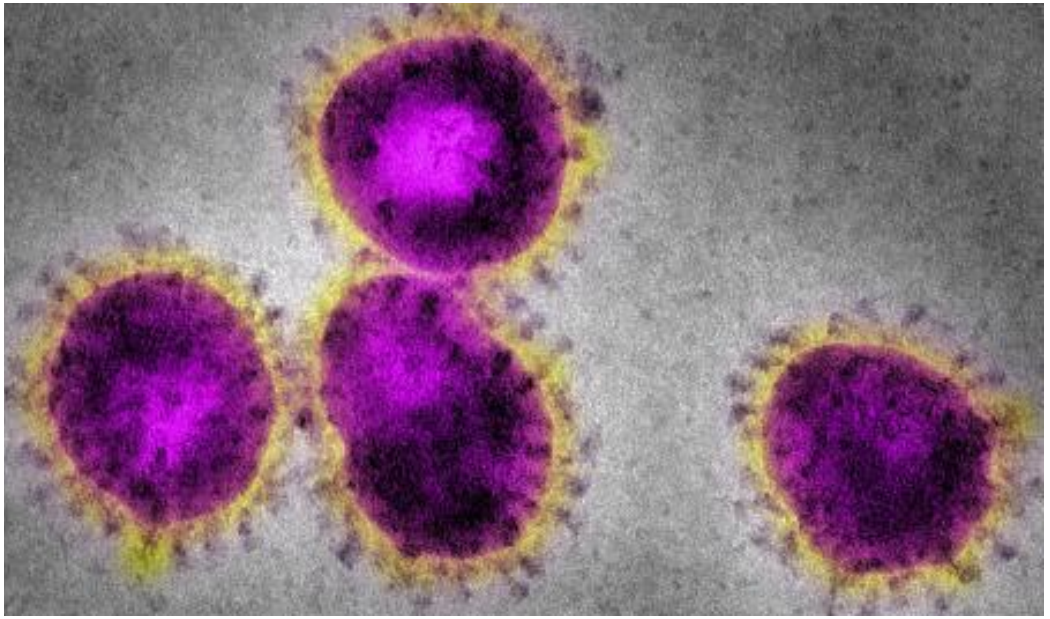
Objective

- To state our perspective on the risk of COVID-19 using Non-Contact Tonometer (NCT).
- To summarize and share the outcome of related studies.



Investigation Sources

- Literature Research

  Data Sources：

  - PubMed
  - Cochrane Database of Systematic Reviews
  - Meta-analysis and reviews of health technology assessment (HTA) institutes and networks

  Search Period：past 5 years

- Official announcements by Public Organizations

Study1 Relevance between COVID-19 and conjunctivitis

- 3.3% (1 out of 30) patients with COVID-19 had conjunctivitis [1]
- 0.8% (9 out of 1099) patients with COVID-19 had conjunctivitis [2]
- 2.8% (2 out of 72) patients with COVID-19 had conjunctivitis [3]
- 1.5% (1 out of 63) patients with COVID-19 had conjunctivitis [4]

Summary:

0.8 to 3.3% patients with COVID-19 had conjunctivitis

Study2 Presence of virus in conjunctiva region

- Positive result in conjunctival sac (3 out of 30 patients: 1 with conjunctivitis and 2 without conjunctivitis). [5]
- Positive result by conjunctival swab test (2 out of 38 patients). [6]

Summary:

- 3.6 to 16.7% patients with conjunctivitis had COVID-19
- COVID-19 was detected in conjunctiva region having no conjunctivitis

Study3 Presence of virus in tears

- Positive result in tears (1 (with conjunctivitis) out of 30 patients). [7]
- No virus was detected in tears out of 17 patients with COVID-19. [8]
- Citing the above study [8] , the risk of infection through tears is low, however the study suggests that tears may cause COVID-19 transmission. [9]
- Citing the above study [8] , the risk of infection through tears is low. [10]

Summary:

- Patients with COVID-19 in tears is 3.3% or less

Study4 Risk of airborne transmission

- The main route of COVID-19 transmission is respiratory droplets and indirect contact, however infection via aerosol or tears has not been reported. [11]
- COVID-19 is a droplet infection, however, no infectious particles in the air have been detected. [12]

Summary:

- Infection via aerosol or tears is not detected

Study5 WHO announcement

- Current evidence from WHO that COVID-19 is transmitted among people mainly through respiratory droplets and contact routes. [13]
- WHO states that no airborne transmissions were reported in an analysis of 75,465 COVID-19 cases. [14]

Summary:

- COVID-19 is transmitted through respiratory droplets and contact routes, no airborne transmission is reported

Study6 Transmission using NCT

- NIDEK could not confirm any literature indicating transmission of infectious diseases by NCT examination
- NIDEK has been manufacturing and marketing NCT for many years and we have not received any reports that infectious disease has been transmitted from NCT.
- The main route of COVID-19 transmission is reported through respiratory droplets and indirect contact. Human respiration volume is approx. 480-600 mL (tidal value: 8 to 10mL/kg [15] , weight: 60kg weight). On the other hand, the maximum air puff volume of NCT is 14 mL and is less than 3% of the human respiration volume.

Summary:

- Transmission using NCT is not reported
- Air puff volume of NCT is less than 3% of breathing

Conclusion

- 0.8 to 3.3% patients with COVID-19 had conjunctivitis
- 3.6 to 16.7% patients with conjunctivitis had COVID-19
- Patients with COVID-19 in tears is 3.3% or less
- COVID-19 is transmitted through respiratory droplets and contact routes, no airborne transmission is reported
- Transmission using NCT is not reported
- Air puff volume of NCT is less than 3% of breathing

Risk for COVID-19 Infection using NCT

= Very unlikely to be affected

Instructions for using NCT

- Clean patient contacting areas frequently
- Before using a disinfectant on NCT, soak the cloth in a solution diluted with neutral detergent, and squeeze it well and wipe off the area
- Disinfectants that can be used for NCT are Ethanol, IPA (Isopropyl Alcohol), and Hypochlorous Acid Water.
  When wiping up with disinfectant, wipe gently
- Ask the patient to wear a mask
- NIDEK will provide a Breath Shield for NCT and TONOREFⅢ

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