

Risk of acquisition of SARS-COV 2 (Corona virus) during Waterpolo games is negligible

An analysis of two men's games (1 Dutch National Men's team and bronze medal game of Gwangju 2019) and 1 women's game (Dutch national team)

Definitions and Facts:

-SARS-CoV-2 is believed to spread through close contact and droplet transmission, with fomite transmission likely and close-contact aerosol transmission plausible but unconfirmed (*WHO-2019-nCoV-IPC_WASH-2020.3-eng*).

-Individuals may be infectious for 1-3 days prior to symptom onset and culturable virus has been found in individuals up to 6 days prior to symptom onset. Pre-symptomatic or asymptomatic patients can transmit SARS-CoV-2. At least 12% of all cases are estimated to be due to asymptomatic transmission. It has been estimated that between 23% or as much as 56% of infections may be caused by pre-symptomatic transmission. Individuals are most infectious before symptoms began and within 5 days of symptom onset and pre-symptomatic individuals contribute to environmental contamination (*WHO-2019-nCoV-IPC_WASH-2020.3-eng*)...

-Chlorine is a very efficient disinfectant and swimming in chlorine water is safe (*Hoepelman et al in press*).

-Children below 18 are less susceptible to acquisition of the virus, if contaminated their disease symptoms are less severe and usually they are not important in transmission to others (*WHO-2019-nCoV-IPC_WASH-2020.3-eng*).

-In the analysis of contracting the virus the duration of contact, the frequency of repetition of contact, the type of contact and the viral load of the person who is ill should be taken into account (*WHO-2019-nCoV-IPC_WASH-2020.3-eng*).

-Adults playing Waterpolo are at low risk of death from SARS-COV-2 (*NEJM La Rochelle May 26, 2020 DOI: 10.1056/NEJMp2013413*).

-Transmission of viruses is 80% lower with physical distancing of 1 m or more, compared with a distance of less than 1 m (*Chu et al Lancet. 2020 Jun 1 doi: [10.1016/S0140-6736\(20\)31142-9](https://doi.org/10.1016/S0140-6736(20)31142-9)*)

-Risk of acquisition in the medical literature is defined as close contact (< 30 cm) for more than 3 minutes (leidraad Persoonlijke bescherming in de (poli)klinische setting vanwege SARS-CoV-2, FMS version 3 26052020).

-High risk exposure is in the medical literature defined as exposure to a person with confirmed Covid-19 at a distance of less than 6 ft (1.8m) for more than 10 minutes (*Boulet et al NEJM June 3, 2020 DOI: 10.1056/NEJMoa2016638*)

-In professional soccer a moderate risk is defined as close contact (< 30 cm) for 3 minutes (*E. Goedhart, medical doctor KNVB, personal communication*)

-Professional soccer has restarted in many countries because the risk of acquisition of COVID-19 is considered to be low (UEFA).

Analysis:

Two men's games (1 Dutch National Men's team and bronze medal game of Gwangju 2019)
and 1 women's game (Dutch national team)

-Analysis of 2-meter situation (close contact < 30 cm) see table 1.

Players < 10 sec: 24 x2 (2 players at risk) = 48 times

10-20 seconds 23 x2 =46 times

20 seconds 12 x2 =24 times

Total time at risk during the game:

< 10 seconds =0 times

10-20 seconds 7 x2 =14 times

20-40 seconds 4 x2 =8 times

40-60 seconds 4 x2 =8 time

60 seconds 3 x2 =6 times

This shows that high risk exposure does not occur during a 2-meter situation in Waterpolo, the maximum exposure for player that occurred lasted 2 minutes and 24,4 seconds.

Analysis of contact moments (< 1,5 meter) of the Dutch national women's team (table 2):

The time of being at a distance of less than 1,5 meter from the opponent averaged between 7 minutes and 23 seconds and 32 minutes 18 seconds (average 17 minutes and 9 seconds) during a game of 32 minutes net time (60 minutes overall) .

The number of contacts averaged between 55 and 127 (average 85,4).

62% lasted less than 10 seconds; 83% lasted less than 20 seconds and 95% less than 30 seconds.

This indicates that also in the normal women's' game moderate risk does not occur.

Dutch men's team against France (table 3)

For the men's game the percentage of time with contact distance of less than 1,5 meter was analyzed:

11 players were analyzed. The time with a distance < 1.5 meter averaged between 3 minutes and 34 seconds and 11 minutes and 53 seconds (average 8 minutes and 46 seconds) which is between 29 and 53% of their playing time) during a game of 32 minutes net time (60 minutes overall).

However, one has to take into account that the players with whom they were in contact constantly changed. As has been shown above no player was exposed for more than 3 minutes to a distance < 30 cm.

Conclusion:

- This analysis shows that also in Waterpolo played by persons over 18 years of age no situation high risk situation occurs. Moreover, even no situation, which is in the health care setting considered a moderate risk, occurs during a waterpolo game.
- This analysis shows that even if an asymptomatic player infected would be in the water the change of infecting other players is negligible.

And therefore I conclude that playing Waterpolo is also safe for adults and can restart, just like professional soccer, especially if the following measures are being implemented:

- 1) Symptomatic (with either fever, cough or dyspnea) player does not train nor play and get tested
- 2) If a team player tests positive he goes into quarantine and his team (training mates who are asymptomatic) get tested or go into quarantine for 14 days (unless they have been at greater distance than 1,5 m and are asymptomatic)
- 3) If 2 or more players test positive the whole team goes into quarantine
- 4) If a team player tests positive he goes into quarantine and his team (training mates who are asymptomatic) get tested or go into quarantine for 14 days if they have been at a distance less than 1.5 m for 10 minutes or longer. This team shall not play or train during these 14 days.

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June 23, 2020