RETURN TO FOOTBALL DURING THE COVID19 PANDEMIC

WHAT DID WE LEARN?

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INTRODUCTION

The COVID19 pandemic has impacted societies worldwide at a level previously only experienced during wars or major natural disasters. Pandemics with respiratory or other viruses occur on a regular bases but unlike previous events, SarSCoV2 has brought public life to a halt. As a measure of precaution, both leisure and competitive sports were also at a standstill in most countries, as little was known on the role of Sports in the spreading of COVID19.

As we are now in the aftermath of the pandemic and normal life is resuming in many countries, it is worth assessing the evidence regarding the risk and role of sport and typical sport settings for the pandemic spread of SarS CoV2.

This article therefore aims at summarizing the data gathered around sports activities during the COVID19 pandemic, ranging from preventive measures to the risk of COVID19 disease spread during sporting activity itself. This information might help athletes and sports organisations improving their preparedness for future pandemics.

COVID19 risk mitigation in Sports – the initial approach

For SarSCoV2, good quality data on viral characteristics and mechanisms of contamination in was not readily available in early 2020 and only emerged through studies and investigations during the pandemic. This guided policy makers to initially apply the principle of caution and introduce rather strict measures for Sports activities, many of which were based on no or poor data. Most of these actions were very restrictive, in line with the lock down of any form of public activity during the height of the pandemic.

Two years later, we now start to have a fair amount of data surrounding Sports settings and events of all levels, which allow to establish differentiated recommendations for tailor-made precautions in many different Sport settings.

PREVENTIVE MEASURES

For diseases like COVID19, where no causal cure exists, prevention is the main approach and most resources are spent in this area. In a threatening, hostile pandemic environment, the visibility of such preventive measures plays an equally important role as does their effectiveness to reassure a population which is further destabilized by the large amount of apparently contradicting information on the topic of COVID19 in social- and other media.

The classical infection control measures of social distancing, hand hygiene/ surface decontamination and mask wearing were soon introduced and most sports activities were banned or heavily restricted, assuming they posed a significant risk for viral spread and contamination, as the above key measures are difficult to implement during most sport activities: Social distancing is virtually impossible during team- or contact sports, mask wearing while playing sports is uncomfortable and cumbersome, heavy breathing during exercise is associated with an increased exhalation of potentially virus-loaded respiratory droplets and sports equipment is touched by many different athletes, thus posing a significant risk of surface transmission.

To reduce access of potentially infected individuals to sporting facilities, thermal

screening to identify subjects with fever was implemented, sometimes using advanced technology such as thermal video scanners or screening helmets with augmented reality displays.

To avoid surface contamination, cleaning efforts were increased, and all indoor and outdoor surfaces were regularly disinfected, often supported by newly marketed gadgets such as disinfection tunnels or sanitizing robots.

In the beginning of the pandemic and in addition to the symbolic character of thermal screening and relentless disinfection, there was logic to implement such measures, based on the limited available knowledge at the time. Emerging data however now questions the necessity and effectiveness of certain prevention measures.

Image: Xavi receives Covid-19 vaccine at Aspetar Orthopaedic and Sports Medicine Hospital, Qatar.

THERMAL SCREENING

Thermal screening aims at identifying individuals with fever, which is supposedly one of the key symptoms of COVID19.

Different investigations of the clinical symptoms in athletes suffering of COVID19 revealed that only between 20 and 40% of all COVID19 positives ever experienced fever, and most only for short periods of time[1,2]. Furthermore, in a sports setting, physical exercise itself can lead to slightly increased body temperature, which might interfere with the thermal screening result.

Thus, both sensitivity and specificity of thermal screening to identify subjects positive for COVID19 is likely low and therefore, the method does not appear to be a useful screening tool, especially considering the considerable human resources necessary to implement it.

SURFACE CONTAMINATION

One of the major fears at the beginning of the pandemic was the possibility of "fomite transmission" of SarSCoV2, i.e. transmission by touching objects where the virus would be present. This was fuelled by early studies in reputable medical journals which described the persistence of viable virus and viral material on certain types of surfaces for several days[3].

Studies from many different environments (incl. Sports facilities) have subsequently and convincingly shown that the risk of transmission of SarSCoV2 through contaminated surfaces was in fact very low[4]. Population studies were unable to identify significant viral quantities on surfaces in homes of COVID19 positive subjects[5]. Similarly, in a sports setting, we could not find clinically relevant quantities of viable virus in football club facilities roamed by COVID19 positive athletes[6].

Daily surface cleaning with 0.5% chlorine bleach according to standard infection control procedures seems to reliably eliminate most viable virus.

Thus, so called "deep cleaning" procedures used to eliminate object surface-bound microorganisms with special cleaning and disinfection protocols and special types of chemicals are probably not necessary but yet, considerable resources are deployed for this purpose. The visibility and sometimes spectacular aspect of cleaning and disinfection operations with staff in Hazmat suits spraying disinfectant with gun-like devices might further add to the continued attractiveness of this measure suggesting "protection", although the value from an infection control perspective is limited.

EXPOSURE DURING SPORTS

It appears obvious at first sight that the close contacts during many team- and individual sports present a major risk for viral transmission. It is easy to imagine that small respiratory droplets containing virus exhaled during strenuous exercise will be inhaled by other athletes and cause infections.

For this assumption to be true, several prerequisites need to be in place: First, the infected athlete needs to be in the contagious phase of the infection. Then, other athletes need to be close enough for a long enough time to exhale/ inhale the "same" air containing virus loaded droplets and ultimately, these droplets need to be inhaled in a quantity containing a high enough viral load to cause clinically relevant infection in the recipient.

Upon further scrutiny, it becomes apparent that these prerequisites are very different in different sports and different environments: An infected (and contagious) runner on a forest trail on a windy and sunny summer day is unlikely to infect a person he is passing while running as the exposure time is short, the exhaled respiratory droplets are rapidly diluted by the ambient air and the virus is also incapacitated by UV exposure[7]. It is thus highly unlikely that any passer-by will inhale a large enough quantity of viable virus from the runner to cause infection.

The situation is different in indoor setting such as in a crowded, poorly ventilated gym.

The exposure time to other people's exhalate is long, respiratory droplets from an infected participant can hang in the air for prolonged periods of time, are not dispersed or diluted due to poor air circulation and can thus be inhaled by many other people in the vicinity and thereby cause mass infections.

These theoretical mechanisms have been confirmed in several recent studies: Many professional leagues have restarted their activity relatively early during the pandemic implementing strict monitoring programs with regular testing and thorough contact tracing for positive athletes. They reported their findings in detail, which allows testing of the above hypotheses.

Most studies were published for the Sports of Football and Rugby. Previous research had shown that the contact times between players in football (i.e. the time players were within 1.5m of each other) were mostly less than 90 seconds per match per player[8–10]. Thus, the time of exposure for potential transmission is surprisingly short. Despite different preventive protocols (bubble vs. non-bubble, see below), different infection rates in the respective country, the outcomes were relatively similar: Only very few infections could be traced back to football or rugby activity on the pitch (training or matches) itself. Where comparable, the infection rate in (non isolated) athletes involved in football was similar to the one observed in the general population, i.e. it does not seem that participation in football or rugby was leading to more infections or driving infections in the community (when preventive measures were in place for sports)[1,11–13].

On the other side, several reports also highlight the danger of other sports settings: Mass infections and local outbreaks were reported after squash matches, Zumba classes or Ice hockey matches[14–16] (all practised indoors with participants in a restricted space with poor air circulation). Yet unpublished data also suggests that in certain outdoor sports, where the contact time between players in some playing positions is longer compared to others, infections are more likely in the former: Forwards in rugby participating in scrums and close tackling are more likely to be infected than their teammates playing freely on the field.

As a rule of thumb, outdoor sports in well ventilated environments is likely of low risk for viral transmission, whereas indoor sports with poor air circulation is a high risk setting. This is confirmed by large population contact tracing studies in the normal population, where the risk of outdoor SarSCoV2 transmission was shown to be between 18 and 1000 times lower compared to indoors[17,18].

RISK SITUATIONS IN SPORTS – WHERE DO THE INFECTIONS COME FROM?

With most outdoor sport settings being of low risk for SarSCoV2 according to the available data, contact tracing data from the studies conducted in sports environments nevertheless revealed the source of many infections: Social contacts such as family members, friends or people met at social gatherings were the most common source[1,12]. For outbreaks within teams, carpooling of several athletes to/ from training were the most transmission-prone situation. This is probably due to the fact that in such settings, preventive measures are taken less seriously, thus increasing the risk of transmission.

For the few cases transmitted in the sporting environment, evidence from isolated cases and outbreaks identifies mainly the changing rooms as "high risk" environments. The combination of poor ventilation, limited space, high humidity and aerosol concentration through toilets, showers and recovery baths results in ideal conditions for SarSCoV2 transmission[5].

From a practical perspective, it seems therefore reasonable not to use changerooms or any sanitary amenities in sports facilities during pandemics spreading through aerosols or respiratory droplets.

BUBBLES

As of the above, the main source of infection in athletes are their social contacts. The obvious solution to break this chain of infection is to limit the social interaction between athletes and subjects of unclear infective status. Many organizations in Sports have tried this with the concept of "bubbles". "Bubbles" are non-overlapping groups that are permitted to come into contact with each other while being isolated from others through protective measures. Such measures range from full isolation in dedicated, closed facilities with stringent access control[19] to more open concepts with voluntary limitation of contacts to the own household and no outside social interaction[1,11,13].

While theoretically attractive from an infection control perspective, the concept also has limitations: A real "bubble" with full isolation of athletes and staff requires considerable resources, ranging from a suitable facility, security systems to avoid breaches and "bubbled" staff to service the "bubbled" athletes with food and other necessary services. It is clear that such construct is virtually impossible to keep "tight" over extended periods of time, especially if additional services such as special medical examinations are needed. There are countless examples where bubbles have secretly been breached by athletes and staff, some breaches have led to subsequent mass COVID19 outbreaks within the bubble. Another downside is related to the prolonged sequestration with the same people in the restricted space of the bubble facility, which will inevitably lead to interpersonal conflicts, especially in high pressure environments such as competitive sports. In a bubble, such personal and interpersonal crises are even more difficult to manage, a fact important to consider in times where the mental health of athletes is a hot topic.

Other approaches used the concept of "home quarantine" for athletes, where the athletes were asked to limit their social contacts and stay home outside of matches and training[1,13]. When such concept is used, it has been shown that the rate of infection among athletes is similar to the rate of infections among the general population of the respective region. Advantages are clearly the usually better acceptance by athletes and staff, uncomplicated access of athletes to all necessary facilities at any time (such as medical services) and the fact that much less resources are required to secure and supervise the athletes.

Which solution to choose, to fully, partly or not "bubble" at all, should be guided by different factors. The length of the planned competition period is one of the key variables: For competitions lasting several months and involving many different match sites (for example most football or rugby leagues), it is very difficult to maintain biosecure bubbles, whereas this might be a realistic option for shorter tournaments (days/ weeks). Other factors to consider are the reigning infection rate in the country, testing facilities and frequency,

the type of sport and immune status of the participating athletes.

SPORTS – THE TRADE-OFFS

Aside from elite sport, it should not be forgotten that physical exercise plays an important role in public health. Its beneficial effects range from mental wellbeing to the prevention of numerous pathologies. Policymakers should therefore carefully consider whether heavily limiting Sports and Exercise during a pandemic will really show an overall health benefit for the population. The negative health effects of lockdowns associated with limited exercise outdoors are clear: Body mass index in children and adults has increased, mental health, domestic violence and substance abuse problems increased.

Two years into the pandemic, we have a better understanding about the risk of different sports settings and know that a number of sports can be considered as low risk for viral spread. It should now be possible to find a more differentiated, science-based regulatory approach to Sports activities during a pandemic, which combines the best of two worlds, i.e., limit viral spread but at the same time maintain the public health benefits of regular exercise for the population.

For pathogens spreading through respiratory droplets and aerosols, the risk of transmission during outdoor activities is low, whereas indoor sports activities constitute high risk settings. Allowing the former while limiting the latter could be an option for the future.

SUMMARY – WHAT DID WE LEARN?

Two years of research and experience with SarSCoV2 has increased our understanding of the risks associated with Sports and Sport settings.

The highest risk of viral transmission is encountered during indoor activities in restricted spaces. Outdoor activities are, as a rule of thumb, of low risk.

Screening activities such as temperature measurement appear of low sensitivity and specificity but require significant resources, thus are of limited value. Within Sports facilities, changerooms and sanitary amenities have been shown to be the places most prone to viral nurture and should be closed. Cleaning and disinfection efforts beyond normal surface cleaning is also of little benefit.

Organizing sports according to these basic recommendations while making sure all athletes and support staff are vaccinated allows a safe return to sport with limited risk of viral transmission.

References
Available at www.aspetar.com/journal

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