

Incidence of SARS-COV-2 infection among swimming athletes: data from real life in Apulia (Italy), July 2020/ August 2021

P. Stefanizzi¹, F.P. Bianchi¹, L. Ascaticigno², N. Pantaleo², A. Martinelli¹, A. Di Lorenzo¹, A. Notarnicola³, F. Fischetti³, S. Tafuri¹

Key words: COVID-19, sport activities, pool

Parole chiave: COVID-19, sport, piscina

Abstract

Background. As other indoor sports facilities, swimming pools were closed in Italy from March to May 2020 and from October 2020 to July 2021 due to the outbreak of the COVID-19 pandemic; access to these facilities was restricted to athletes of national relevance. This decision was based on “precautionary principles” and without evidence of a high risk of SARS-COV-2 circulation among swimming pools’ attendants. The aim of this paper is to describe the pattern of SARS-COV-2 circulation among swimming athletes in Apulia (Southern Italy).

Study design. The study aims to investigate the hypothesis that attending a pool increases the risk of SARS-COV-2 infection.

The outcome measure is the incidence of SARS-COV-2 infection among swimming athletes compared with the general population.

Methods. This is a retrospective cross-sectional study carried out in Apulia, Southern Italy.

The study was performed through the analysis of both the database of the Italian Swimming Federation and the SARS-COV-2 infections in Apulia Region, from July 2020 to August 2021.

Results. Among 2,939 federally licensed athletes, 221 had an history of SARS-COV-2 infection from July 2020 to August 2021, with an incidence of 75.2 /1,000. In the general Apulian population, during the same time span, the incidence of SARS-COV-2 infection was 67.3/1,000 and - considering the incidence rate ratio - there is no difference between the two populations (IRR=1.1; 95% CI=0.9-1.3; $p>0.05$).

Conclusions. The incidence of SARS-COV-2 infection in Apulian swimmers showed no significant differences with the general population.

¹ Department of Biomedical Science and Human Oncology, Aldo Moro University of Bari, Italy

² Italian Swimming Federation, Apulia Committee, Bari, Italy

³ Degree Course in Sport and Movement Science, School of Medicine, Aldo Moro University of Bari, Italy

Introduction

On March 11, 2020, the World Health Organization's (WHO) General Director declared that the epidemic related to the circulation of the new SARS-COV-2 virus could be assessed as a pandemic (1). After this statement by the WHO, various countries around the world started a lockdown. Several countries, such as Italy, have restricted the movement of people and instructed home confinement in case of infection, thus limiting or completely halting daily interactions between humans. The countries also closed their national borders, restricting the movement of people and goods, thus hampering the previous economic and human relations among countries (2). During the spring and summer of 2020, almost every international sports competition was cancelled, first of all the Tokyo 2020 Olympic Games.

In Italy, the general lockdown started on March 9, 2020 and continued until May 3, 2020. From May 2020 to September 2021, several measures were adopted to contain the spread of the epidemic, according to the pattern of SARS-COV-2 circulation in the different Italian Regions. Sport activities were suspended for the entire population in the period from March to May 2020, whereas from October 2020 to May 2021, only athletes of national relevance selected by the Italian National Sports Federations were admitted to indoor sport facilities for training (3).

As shown in a 2021 systematic review, most studies highlighted a significant reduction in the amount of physical activity performed during the lockdown, with negative consequences for both general health, in terms of increased body mass, and specific chronic conditions, especially obesity and neurological diseases (4).

As indoor sports facilities, swimming pools were closed in Italy from March to May 2020 and from October 2020 to July

2021; access to them was restricted to athletes of national relevance. This decision was based on "precautionary principles" and without evidence of a high risk of SARS-COV-2 circulation among swimming pools' attendants. In 2020, the Italian Society of Public Health suggested considering a reopening of swimming pools for sports and physical activity (5).

The Italian Swimming Federation has also adopted a protocol to guarantee the safety of athletes during training, based on social distancing, the use of face masks during all indoor activities with the exception of physical exercise, and periodic SARS-COV-2 testing for all athletes (6).

In this scenario, the availability of "real life" data on the circulation of the SARS-COV-2 among swimming athletes, who continued to attend swimming pools even when they were closed to the general population, is crucial for proper risk assessment and to guide Governmental choices in future phases of the pandemic. In our paper, we described the circulation pattern of SARS-COV-2 among swimming athletes in Apulia (South of Italy).

Methods

This is a retrospective cross-sectional study.

The data sources used are:

- the list of swimming athletes authorized by the State through the Italian Swimming Federation to carry out their training despite the pools being closed to the general population;
- the list of confirmed SARS-COV-2 infections, obtained from the database of the Regional Health Authority of Apulia (GIAVA-COVID-19).

Both lists were available for Apulia (a Region of Southern Italy, approximately 4 million inhabitants). Inclusion criteria were the following:

- For the “case” group: subjects regularly registered with the Italian Swimming Federation between 1st July 2020 and 31st August 2021;

- For the “control” group: all subjects living in Apulia, considered by age classes. No exclusion criteria were employed.

Data were used to build a database via software Microsoft Excel®, while software Stata MP17 was used for statistical analysis.

The two databases were cross-linked using the sanitary code as key (Fig. 1).

We calculated the incidence of SARS-COV-2 infection among swimming athletes from 1st July 2020 to 31st August 2021, using as numerator the number of swimmers with a history of at least 1 SARS-COV-2 infection and as denominator the total number of swimmers from the Federation database.

This value was compared with the incidence of infection in the general population of Apulia. Data were subdivided by age group and incidence rate ratio values were calculated, with 95% CI.

Results

In Apulia, the Italian Swimming Federation authorized 2,939 athletes to train during the hard lockdown phase, because they were defined as “nationally relevant”.

The division by age groups was: 0-10 years, 345 athletes; 11-20 years, 2,394; 21-30 years, 154; 31-40 years, 33; 41-50 years, 7; 51-60 years, 6. No licensed athletes were over 60 years of age.

Of 2,939 athletes, 221 had a history of SARS-COV-2 infection diagnosed from July 2020 to August 2021, with an incidence of 75.2/1,000. In the general population of Apulia, the incidence of SARS-COV-2 infection was 67.3 x1,000 during the same period, and when considering the incidence rate ratio (IRR), there was no significant difference between the two populations (IRR=1.1; 95% CI=0.9-1.3; p>0.05).

Table 1 describes the comparison of incidence values between the two groups, divided by age groups.

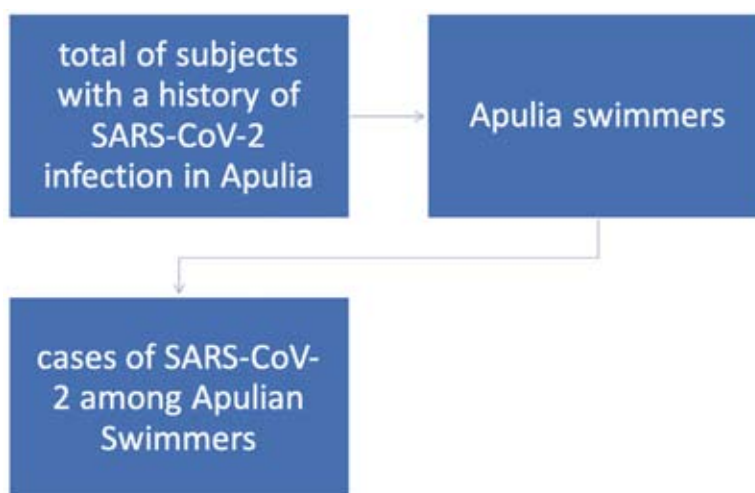


Fig 1 - Sources of information used in the survey

Table 1 - Incidence of SARS-COV-2 among swimming athletes of national relevance and general population, Puglia (Italy), July 2020-August 2021.

Age class	Incidence among swimming athletes x1000	Incidence among general population x1000	IRR	95% CI IRR	P
4-10 years	31.9	45.6	0.7	0.4-1.2	Ns
11-20 years	78.1	68.3	1.1	0.9-1.3	Ns
21-30 years	110.4	77.7	1.4	0.8-2.2	Ns
31-40 years	151.5	75.2	2.0	0.6-4.7	Ns
41-50 years	0	71.5	0	-	Ns
51-60 years	166.7	74.0	2.2	0.1-12.5	Ns

Discussion and Conclusions

The incidence of SARS-COV-2 infection in Apulian swimmers showed no significant differences with that of the general population, although the crude data for subjects aged >30 years appears very high. This difference in results could be explained by the low number of athletes aged >30 years.

Although statistical significance has not been established, there are two considerations to make about these results. First, the higher incidence value could be explained by adherence to the recommendations of the Italian Swimming Federation, which encouraged periodic SARS-COV-2 testing for its athletes. As in other international experiences, repeat testing was associated with an increase in the detection of SARS-CoV-2 cases, exceeding nationally reported infection rates because more carriers, often transient and asymptomatic, were detected (7). These data are not suggestive of a truly higher incidence or increased risk in the athlete population, and recent evidence has suggested a critical review of the use of periodic testing as a screening method (8).

Second, the incidence of infection in 4 to 10-year-old subjects seemed lower than in the general population. This is probably due to the fact that in swimming pools children must respect the rules of a sanitary protocol,

which are likely effective in limiting the spread of infection; the same rules are arguably not enforced in other settings (such as kindergartens and elementary schools).

Vaccination strategies have also changed the circulation pattern of SARS-COV-2, reducing the incidence and in particular, the case/fatality rate. In the era of vaccination, precautionary principles should be abandoned and replaced by epidemiological evidence. Thus, policymakers' decisions about the interruption of the sport activities should be made after an accurate risk/benefit assessment. Furthermore, the available evidence suggests that the risk of increased sedentary behaviors during lockdowns is sizeable for our population, and keeping sport facilities open would be beneficial to both the physical and mental health of the population (9).

Conflicts of Interest and Source of Funding: Authors have not conflict of interest to declare. No funds were requested or obtained to carry out this study.

Data access statement: Data are available on reasonable request to the corresponding author.

Ethics statement: The research did not involve experimental activities on humans or animals. Research was conducted according to the Declaration of Helsinki and data were managed according to the Italian law on anonymity and privacy.

Riassunto

Incidenza dell'infezione da SARS-CoV-2 tra i nuotatori agonisti: dati da uno scenario di real life in Puglia (Italia), Luglio 2020/Agosto 2021

Background. In quanto strutture per l'attività sportiva indoor, le piscine sono state chiuse in Italia da marzo a maggio 2020 e da ottobre 2020 a luglio 2021 a causa della pandemia di COVID-19; l'accesso a tali strutture è stato ristretto ad atleti di rilevanza nazionale. Questa decisione è stata basata sul "principio di precauzione" e senza evidenza di un alto rischio di circolazione di SARS-CoV-2 tra gli utenti delle piscine.

Disegno dello studio. Lo scopo di questo articolo è descrivere lo schema di circolazione di SARS-CoV-2 tra i nuotatori agonisti in Puglia (Sud Italia). Lo studio mira a indagare l'ipotesi che la frequentazione di piscine possa incrementare il rischio di infezione da SARS-CoV-2. La misura di risultato è l'incidenza di infezione da SARS-CoV-2 tra gli atleti agonisti rispetto alla popolazione generale.

Metodi. Questo è uno studio retrospettivo trasversale condotto in Puglia, nel Sud Italia.

Lo studio è stato svolto tramite l'analisi del database della Federazione Italiana Nuoto e delle infezioni da SARS-CoV-2 registrate in Puglia da luglio 2020 ad agosto 2021.

Risultati. Di 2.939 atleti con licenza della Federazione Italiana Nuoto, 211 presentavano una storia di infezione da SARS-CoV-2 tra il luglio 2020 e l'agosto 2021, con incidenza di 75,2/1.000. Nella popolazione generale pugliese, durante lo stesso periodo, l'incidenza dell'infezione è stata di 67,3/1.000. Considerando il rapporto tra i tassi d'incidenza, non c'è differenza tra le due popolazioni (IRR=1,1; 95% CI=0,9-1,3; p>0,05).

Conclusioni. L'incidenza dell'infezione da SARS-CoV-2 tra i nuotatori agonisti pugliesi non ha mostrato differenze significative con quella registrata nella popolazione generale.

References

1. World Health Organization (WHO). WHO Director-General's opening remarks at the media briefing on COVID-19 – 11 March 2020. Available on: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020> [Last accessed: 2022 February 15].
2. Onyeaka H, Anumudu CK, Al-Sharif ZT, Egele-Godswill E, Mbaegbu P. COVID-19 pandemic: A review of the global lockdown and its far-reaching effects. *Sci Prog.* 2021 Apr-Jun; **104**(2): 368504211019854. doi: 10.1177/00368504211019854. PMID: 34061685.
3. Governo Italiano, Presidenza del Consiglio dei Ministri. Coronavirus, le misure adottate dal Governo. Available on: <http://www.sitiarcheologici.palazzochigi.it/www.governo.it/febbraio%202021/it/coronavirus-misure-del-governo.html> [Last accessed: 2022 February 15].
4. Zaccagni L, Toselli S, Barbieri D. Physical Activity during COVID-19 Lockdown in Italy: A Systematic Review. *Int J Environ Res Public Health.* 2021 Jun 13; **18**(12): 6416. doi: 10.3390/ijerph18126416. PMID: 34199286; PMCID: PMC8296244.
5. Romano Spica V, Gallè F, Baldelli G, et al. Swimming Pool safety and prevention at the time of Covid-19: a consensus document from GSMS-SItI. *Ann Ig.* 2020 Sep-Oct; **32**(5): 439-48. doi: 10.7416/ai.2020.2368. PMID: 32578839.
6. Federazione Italiana Nuoto. Emergenza Covid-19. Misure di sicurezza da adottare nelle piscine per gli allenamenti e le competizioni sportive. Available on: <https://www.federnuoto.it/home/federazione/linee-guida-covid-19/6569-linee-guida-federali-emergenza-covid-19-misure-di-sicurezza-da-adottare-nelle-piscine-per-gli-allenamenti-e-le-competizioni-sportive-3/file.html> [Last accessed: 2022 February 15].
7. Crowe J, Schnaubelt AT, SchmidtBonne S, et al. Assessment of a Program for SARS-CoV-2 Screening and Environmental Monitoring in an Urban Public School District. *JAMA Netw Open.* 2021 Sep 1; **4**(9): e2126447. doi: 10.1001/jamanetworkopen.2021.26447. PMID: 34550382.
8. Farfour E, Amiel C, Lecuru M, et al. SARS-CoV-2 screening of asymptomatic health care workers: experience of a General hospital. *Ann Biol Clin (Paris).* 2021 Aug 1; **79**(4): 325-30. doi: 10.1684/abc.2021.1664. PMID: 34526289.
9. Rahman A M, Chandrasekaran B. Estimating the Impact of the Pandemic on Children's Physical Health: A Scoping Review. *J Sch Health.* 2021 Nov; **91**(11): 936-47. doi: 10.1111/josh.13079. Epub 2021 Sep 3. PMID: 34494270.