Annals of Medicine and Surgery 66 (2021) 102375

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Short Communication

Seroprevalence of SARS-CoV-2 in unselected surgical patients: An update from an unicentric regional study

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ARTICLE INFO

Keywords:
SARS-CoV-2
COVID-19
Surgery
Immunoglobulin
IgG
IgM

After a mitigation in the Summer season [1], the COVID-19 pandemic is progressing quickly in Europe. In Italy the COVID-19 total number of registered cases at the end of 2020 has reached over 2 million units with about 75,000 confirmed deaths, causing an excessive load to the national healthcare system [2–4].

Our region, Sardinia, showed an important increase in SARS-CoV-2 cases: the total number has reached quickly over 30,000 cases and 750 deaths attributable to COVID-19 [4], forcing local authorities to reorganize the hospitals, with a sharp reduction in ordinary surgical activities. In our Department of General and Endocrine Surgery of University Hospital of Cagliari, a non-dedicated COVID-19 hospital, activity was reduced from the first week of November, allowing only emergencies, oncological and not postponable procedures.

Similarly as we have done in our previous work [5], we have herein analysed the patients admitted to our Department that underwent testing for SARS-CoV-2 Antibodies (Ab) to evaluate the difference of seroprevalence between Spring and Fall seasons, and to estimate the prevalence of SARS-CoV-2 infection in the setting of a non-dedicated COVID-19 hospital in a mild-incidence area.

Between 1St September – 10Th December 2020, 121 patients were admitted to our Department for elective surgery, performed serologic tests for SARS-CoV-2 during the prehospitalization check, and were included in this study.

All patients were asked for SARS-CoV-2 risk factors, including symptoms during the last 2 weeks and close contact with confirmed cases.

A Chemiluminescent-Analytical-System (CLIA) for the detection of both IgM and IgG antibodies against SARS-Cov-2 Spike protein and N-protein on Maglumi platform (Snibe, Shenzhen, China) was employed (IgM cut-off 1.0 AU/mL, IgG cut-off 1.1 AU/mL).

The main indication for elective surgery was thyroid and parathyroid disease in 57 (47.1%) cases, including thyroid malignancy, goiter and hyperparathyroidism. Surgery for breast, colorectal, skin cancer, and abdominal wall disease was also performed. All patients underwent a chest X-ray. No suspicious radiological signs were detected.

All 121 patients underwent at least one nasopharyngeal swab before admission. RT-PCR was performed by GENESIG primerxdesign ® LTD, Chandels' Ford UK on CFX96 BioRad, (Cycle Threshold from 20 to 40).

Forty-one (33.9%) patients were males and 80 (66.1%) females, with a mean age of 58.6 ± 16.6 years.

At serology, 8 (6.6%) patients tested positive for only SARS-CoV-2 specific IgM, and 5 (4.1%) for only SARS-CoV-2 specific IgG (Table 1).

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https://doi.org/10.1016/j.amsu.2021.102375
Received 9 April 2021; Accepted 28 April 2021
Available online 4 May 2021

No patient tested positive for both SARS-CoV-2 specific IgM and IgG. In patients with positive serologic tests, we found IgM and IgG mean values of 2.9 ± 3.3 AU/ml and 2.4 ± 1.2 AU/ml, respectively. Thus, in our series, total seroprevalence for SARS-CoV-2 (IgG + IgM) was 10.7%.

Overall, the mean hospital stay was 5.5 days (range 1–60).

Nasopharyngeal swabs were negative in all the cases except one, whose positivity prevented hospitalization. In this patient, serologic test was positive for IgM (1.6 AU/ml) and negative for IgG. Subsequent epidemiological investigation revealed that the infection occurred in the family environment.

Surgical related occurrences were observed in 18 (21.8%) patients: 10 cases of hypoparathyroidism and 5 cases of recurrent laryngeal nerve injury following total thyroidectomy, 2 post-operative bleeding who required revision surgery for haemostasis, and one surgical site infection following a colostomy closure.

Due to the close contact with an operator who subsequently tested positive, two patients, whose serologic tests were both negative, were immediately quarantined in separate rooms. Subsequent nasopharyngeal swabs, performed at days 1–3 and 10, tested negative, no COVID-19 attributable symptoms occurred.

All patients were contacted 15 days after discharge, to evaluate if symptoms due to SARS-CoV-2 infection had developed. As far as we know, no patient has developed relevant symptoms.

The main limitation of this study is its monocentric nature, moreover, considering the high variability of the epidemiological distribution of the infection, it can't be considered representative of a large population. However, some reflections can be made, regarding the current seroprevalence, the complication rate and the utility of PPE.

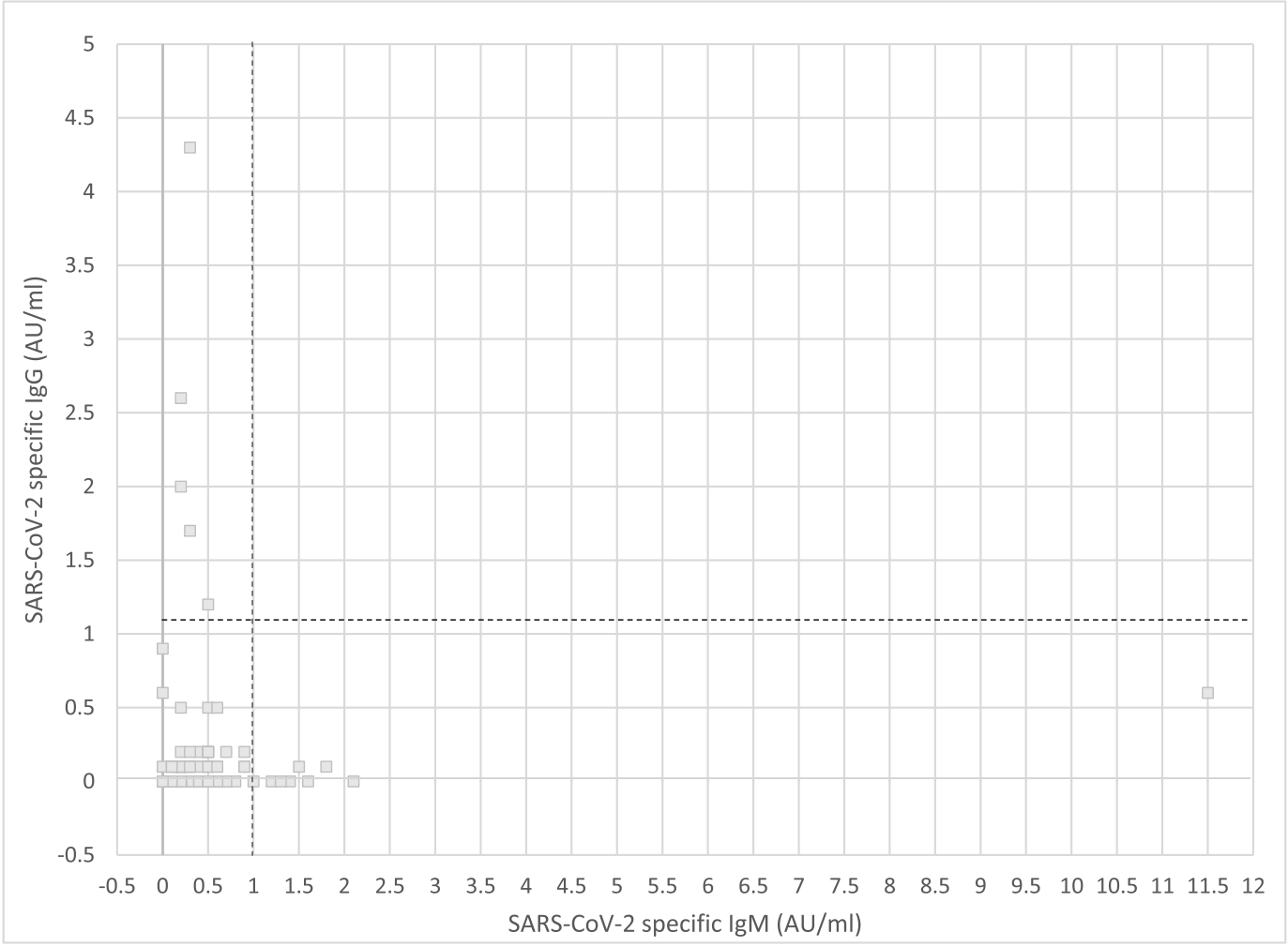
Antibody testing offers evidence of previous infection with SARS-CoV-2 or of recent exposure (correlated with transmission risk), being useful to determine the proportion of a population who has been infected to help predict future infection dynamics and health decisions [6].

In our previous work, we reported an estimated seroprevalence among patients admitted to surgery for SARS-Cov-2 specific IgM and IgG of 5.8%, highlighting that the real prevalence was higher than estimated in the official series (5.8% vs 2%) [5]. No further data on seroprevalence from official institutions have been published till August.

According to the recrudescence of the pandemic, the seroprevalence among our unselected surgical patients has doubled when compared to the first period (10.7% vs 5.8%). This figure is widely higher than the prevalence officially reported from RT-PCR tests, which in Sardinia is about 2%, demonstrating that the amount of patients who are not highlighted with epidemic investigations is still high.

Notably, other Italian authors have investigated the seroprevalence of SARS-Cov-2 in their regions, with extremely heterogeneous results based on the population studied and the latitude of the region under examination, with a seroprevalence ranging from about 2 to 4% in the

Table 1
SARS-CoV-2 Antibodies testing. Each square represents a patient. IgM cut-off is 1.0 AU/mL, IgG cut-off is 1.1 AU/mL.



southern regions and 23.1% in the northern regions [7–9].

Compared to the previous period, we observed a higher rate of surgical complications (21.8% vs 11.6%); we hypothesize that this data may be related to diagnostic and treatment delay caused by the first slowdown in surgical activity, which led to an increase in more complex definable cases.

Although there have been close contacts established between staff who then tested positive and patients, we have not recorded infections within our unit. We think this data can be justified by the careful use by staff and patients of adequate PPE and rigorous hands washing after each contact.

In conclusion, we believe that careful screening before admitting patients to the ward, combined with adequate use of PPE, could avoid the collapse of our health system and prevent further delays in the treatment of surgical diseases.

Also, considering the recent evidence of the efficacy of the vaccines tested so far [10–12], healthcare staff should be vaccinated as soon as possible.

Data availability statement

The data used to support the findings of this study are available from the corresponding author upon request.

Sources of funding

No funding for the research was received.

Ethical approval

Ethical approval was not needed for this study.

Author contribution

Federico Cappellacci: design of the study, analysis of data, drafting the manuscript, final approval of the version to be published. Giacomo Anedda: acquisition of data, analysis of data, critical revision of the manuscript, final approval of the version to be published. Stefano del Giacco: critical revision of the manuscript, final approval of the version to be published. Ferdinando Coghe: Interpretation of data, critical revision of the manuscript, final approval of the version to be published. Riccardo Cappai: critical revision of the manuscript, final approval of the version to be published. Gian Luigi Canu: Interpretation of data, critical revision of the manuscript, final approval of the version to be published. Enrico Erdas: critical revision of the manuscript, final approval of the version to be published. Pietro Giorgio Calò: Interpretation of data, critical revision of the manuscript, final approval of the version to be published. Fabio Medas: design of the study, analysis and interpretation of data, drafting the manuscript, final approval of the version to be published. Davide Firinu: design of the study, interpretation of data, drafting the manuscript, final approval of the version to be published.

Trial registry number

1. Name of the registry: ClinicalTrials.gov.
2. Unique Identifying number or registration ID: NCT04839913.
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): https://clinicaltrials.gov/ct2/show/NCT04839913.

Guarantor

Dott. Federico Cappellacci.

Consent

Informed consent was administered to each patient involved in the study.

Declaration of competing interest

The authors declare no conflicts of interest.

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