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Practice points

Usefulness of the epidemiological survey and RT–PCR test in pre-surgical patients for assessing the risk of COVID-19

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The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic represents one of the greatest challenges for any well-developed healthcare system. To date, more than 5.4 million people have been infected worldwide and more than 340,000 deaths have been reported due to coronavirus disease 2019 (COVID-19) [1]. At the time of the highest incidence of the infection in Spain, it was recommended to postpone all elective surgeries [2]. However, as the incidence decreases, the surgical services will progressively resume their schuleded activity. Patients undergoing elective surgery may have asymptomatic SARS-CoV-2 infection with risk of nosocomial transmission and increased mortality after surgery [3,4]. So far, there has been no consensus on how to assess the risk of SARS-CoV-2 infection in pre-surgical patients. Epidemiological survey, radiological tests (chest X-ray or chest computed tomography) and microbiological tests (detection of the virus in the nasopharynx by SARS-CoV-2 reverse transcription polymerase chain reaction (RT–PCR) have all been proposed by some scientific societies to evaluate the patients prior to surgery [5].

We carried out a prospective observational cross-sectional study between April 15th and May 15th, 2020. The study was conducted at a tertiary level university hospital in a low-incidence SARS-CoV-2 infection region in Spain (3.34 per 100,000 inhabitants between May 1st and 15th, 2020) [6]. Elective surgery patients were routinely screened with SARS-CoV-2 RT–PCR (Allplex 2019-nCoV Assay®; Seegene, Seoul, South Korea) on nasopharyngeal and oropharyngeal exudate samples after nucleic acid extraction with the automated MagCore HF16 system (RBC Bioscience®; Taipei, Taiwan). An epidemiological interview was also conducted during part of the study period (16th to 28th April 2020). Baseline characteristics and risk factors associated with SARS-CoV-2 infection were collected from the subjects. In these patients, the presence of symptoms related to SARS-CoV-2 infection in the 14 days before surgery was also recorded. Analytical parameters and radiological characteristics (if available within 24 h before surgery) were analysed.

During the study period, 363 patients were included and 112 were invited to complete an interview, although only 107 agreed to participate. Baseline characteristics and risk factors associated with SARS-CoV-2 infection are shown in Table I. None of the patients had clinical symptoms suggestive of COVID-19 or previous epidemiological contact with COVID-19

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Table I
Clinical characteristics and details of epidemiological interview in 112 preoperative patients

Variable	No. (%) of cases
Age[a]	58.5 ± 20.72
Sex (female)	70 (62.5)
Residence 14 days before surgery	
Home	90 (78.6)
'Our hospital'	18 (16.1)
Another hospital	5 (4.5)
Nursing home	1 (0.9)
Comorbidities (≥2)	49 (43.8)
Hypertension	46 (41.1)
Diabetes mellitus	25 (22.3)
Renal impairment	8 (7.1)
Heart failure	12 (10.7)
Ischaemic cardiomyopathy	11 (9.8)
Chronic obstructive pulmonary disease	4 (3.6)
Asthma	1 (0.9)
Neoplasia	58 (51.8)
Obesity	7 (6.3)
Immunosuppression	1 (0.9)
Type of surgery	
Cardiovascular	10 (8.9)
Gynaecology/obstetrics	24 (21.4)
Breast surgery	5 (4.5)
Urology	12 (10.7)
Neurosurgery	10 (8.9)
Thoracic	6 (5.4)
General surgery	24 (21.4)
Trauma	9 (8)
Ophthalmology	3 (2.7)
Plastic surgery	3 (2.7)
Maxillofacial surgery	1 (0.9)
Paediatric surgery	5 (4.5)
Asymptomatic[b]	107
Previous contact with a COVID-19 case[b]	0 (0)
Mask during hospital or at-home stay[b]	14 (13.1)
Shared room during hospital stay[b]	8 (7.5)
Familiar mask (hospital stay or at home)[b]	16 (15.0)
Admitted in different rooms during hospital stay[b]	8 (7.5)
Cohabitants or companions[b]	
0	7 (6.5)
1	41 (38.3)
2	25 (23.4)
≥3	34 (31.8)

[a] Mean ± standard deviation.
[b] Five patients refuse epidemiological interview; percentage based on a denominator of 107.

cases. SARS-CoV-2 RT–PCR test was positive in two patients, one of them being classified as a false-positive result. The patient and two persons living with him were completely asymptomatic, he was in quarantine at the time, and the RT–PCR test was repeated twice, being negative on both occasions. Two different rapid serology tests were also done with negative results on both occasions. Surgery was delayed one week to rule out the initial COVID diagnosis; after surgery, the patient developed no postsurgical complications. Thus, only one out of 363 SARS-CoV-2 RT–PCR tests was considered to be a true-positive result (prevalence: 0.27%). An epidemiological survey was carried out, and it was found that the patient and three other family members had had rhinorrhoea and cough the previous three weeks. The patient also tested positive for anti-SARS-CoV-2 IgG antibodies. Although the patient was asymptomatic the surgical team decided to postpone surgery until the SARS-CoV-2 RT–PCR test was negative.

The best way to stratify the risk of SARS-CoV-2 infection in surgical patients is yet to be defined. In our cohort, the epidemiological survey was useful to stratify the risk, while the analytical and radiological survey were not shown to be relevant. The value of the survey would increase in a low-incidence context (as false-positive RT–PCR test results would rise), as is the case in our region [7]. However, lack of symptoms cannot rule out COVID-19 infection, as the percentage of patients who remain asymptomatic is difficult to estimate: there is no way to differentiate from those who are in the incubation period. The fact that asymptomatic cases could transmit the virus has been clearly demonstrated and therefore they represent a high risk of nosocomial infection [4].

In conclusion, we found that one out of two patients with a positive SARS-CoV-2 RT–PCR result likely had a false-positive result. False-positive test results can occur at the pre-analytical or analytical stages [8]. The possibility of false-positive test results during screening in low-incidence areas needs to be considered, and will become an increasing problem as the incidence of COVID-19 decreases (post-pandemic period). Epidemiological assessment may become an increasingly important component of determining patients with positive SARS-CoV-2 RT–PCR screening test results or in scenarios where this test is not available.

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References

[1] Johns Hopkins Coronavirus Resource Center. COVID-19 map. 2020. Available at: https://coronavirus.jhu.edu/map.html [last accessed May 2020].
[2] Brindle M, Gawande A. Managing COVID-19 in surgical systems. Ann Surg 2020 May 12 [Epub ahead of print].
[3] Aminian A, Safari S, Razeghian-Jahromi A, Ghorbani M, Delaney CP. COVID-19 outbreak and surgical practice: unexpected fatality in perioperative period. Ann Surg 2020 May 12 [Epub ahead of print].
[4] Bai Y, Yao L, Wei T, Tian F, Jin D-Y, Chen L, et al. Presumed asymptomatic carrier transmission of COVID-19. JAMA 2020;323:1406–7.
[5] American College of Surgeons. Local resumption of elective surgery guidance. 2020. Available at: https://www.facs.org/covid-19/clinical-guidance/resuming-elective-surgery [last accessed May 2020].
[6] Ministerio de Sanidad, Consumo y Bienestar Social – Profesionales – Situación actual coronavirus. 2020. Available at: https://www.

mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/situacionActual.htm [last accessed May 2020].

[7] Guan Q, Liu M, Zhuang YJ, Yuan Y, Wang SS, Li J, et al. Epidemiological investigation of a family clustering of COVID-19. Zhonghua Liu Xing Bing Xue Za Zhi Zhonghua Liuxingbingxue Zazhi 2020;41:629—33.

[8] Iglesias JAM. Documento de posicionamiento de la SEIMC sobre el diagnóstico microbiólogo de COVID-19. SEIMC. 2020. Available at: https://seimc.org/documentos-cientificos/documentos-de-consenso [last accessed May 2020].