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Adverse effects of nasopharyngeal swabs: Three-dimensional printed versus commercial swabs

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To the Editor—To date, >6 million tests for COVID-19 have been performed in the United States, with the vast majority utilizing nasopharyngeal sampling.[1] The need for large-scale testing in the COVID-19 pandemic has created a global shortage of commercial nasopharyngeal swabs. One approach to this shortage has been the 3-dimensional (3D) printing of nasopharyngeal swabs. Swabs printed on a 3D printer (3D swab) differ somewhat from commercially produced swabs: they having larger heads, less flexibility, and a plastic rather than cotton or polyester fiber tip. These 3D swabs are class 1 medical devices, and their diagnostic efficacy has been validated through field testing.[2]

Guidance on the safe collection of nasopharyngeal samples using commercial swabs is available in text and video format[3,4]; however, no data are available on the adverse effects of either commercial or 3D swabs, making it difficult to assess their relative safety. To expand testing at our medical center, we printed the Northwell prototype 3D swab using specifications obtained from the technology transfer office at the University of South Florida. As part of our safety assessment of this prototype, we identified adverse effects of NP swabbing in employees using both commercial and 3D swabs. Epistaxis occurred immediately or shortly following the removal of the swab in 5.0% of employees tested with the 3D swab and in 8.3% of employees tested with the commercial swab (Table 1). Epistaxis was usually mild and self-limited, although 1 employee required an emergency department visit for ongoing epistaxis after testing with a commercial swab. Other minor adverse effects included nasal discomfort, headache, earache, and rhinorrhea, which typically lasted hours to a day.

Table 1. Comparison of 3D Printed Nasopharyngeal Swabs Versus Commercial Swabs

Variable	Commercial Swab, No.	3D Swab, No.
Sample size	96	80
Epistaxis, no. (%)	8 (8.3)	4 (5.0)
Nasal discomfort	4	6
Headache	5	2
Ear discomfort	5	1
Rhinorrhea	5	1

Our finding that epistaxis is equally common after the use of 3D and commercial swabs provides reassurance that 3D swabs are a safe alternative to commercial swabs. However, the ~5%–10% incidence of epistaxis after nasal swabbing with either commercial or 3D swabs warrants caution in testing individuals at increased risk for bleeding. Nursing home residents have been disproportionately affected by COVID-19, and a recent point prevalence study of Medicare fee-for-service beneficiaries found that almost half of 37,787 nursing home residents were treated with oral anticoagulants.[5] Rates of epistaxis after nasal swabbing should be studied in larger populations, including the elderly, and individuals at increased bleeding risk should be monitored after the procedure. Fortunately, less invasive methods of SARS-CoV-2

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detection, such as midturbinate or saliva sampling, are on the horizon.

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Pediatric antimicrobial stewardship in the COVID-19 outbreak

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To the Editor—Growing evidence supports the positive impact of antimicrobial stewardship programs (ASPs) on antimicrobial use, including pediatrics.[1] Although short of the level of acceptance these have reached in the United States, the implementation of pediatric ASPs in European hospitals has increased over the last few years.[1]

It has been suggested that the ASP should be helpful in the preparation for and response to the SARS-CoV-2/COVID-19 outbreak,[2] but no formal recommendations have been published. Whether pediatric ASP remains an essential activity or not during the COVID-19 pandemic has yet to be clarified. Here, we describe how the COVID-19 pandemic has impacted antimicrobial use in a referral pediatric hospital, and we propose a supporting role for ASP teams in the local management of the outbreak.

The first COVID-19 case in Catalonia, Spain, was reported on February 25, 2020. By mid-March, most pediatric and obstetrics departments in the region were shut to increase the capacity for adult COVID-19 patients. Hospital Sant Joan de Déu Barcelona (SJD) remained the largest pediatric and maternal referral center in the region. COVID-19 and non–COVID-19 pediatric and young adult patients were transferred to our wards and pediatric ICU (PICU), and the number of daily deliveries tripled, whereas all nonemergency clinical, teaching, and research activities were postponed. Compared to the same months in 2019, in March 2020, total hospital stays decreased by 0.8% in the PICU and 15.2% in non-PICU areas, and in April 2020, total hospital stays decreased by 23.7% in the PICU and 22.2% in non-PICU areas.

Following institutional recommendations, the SJD-ASP[3] team reduced on-site work, but they continued to provide specific recommendations on individual antimicrobial prescriptions upon consultation by prescribers, and they monitored systemic antibiotic and antifungal use: days of-therapy (DOT) per 100 days present (DP). From March 16 to April 30 2020, 210 randomly selected prescriptions were assessed for quality.[3]

Because SARS-CoV-2 is a viral infection, it is not expected to directly influence antibiotic or antifungal use beyond the use of antibiotics with possible antiviral effect (ie, azithromycin)[4] and the use of broad-spectrum antibiotics for superinfection in severe COVID-19 patients.[5] However, we also observed antimicrobial use changes indirectly related to the outbreak. Antimicrobial use in March and April 2020 was significantly higher than in the same months in 2019 (Table 1). As expected, the use of azithromycin, included as first-line therapy in severe COVID-19 patients in combination with hydroxychloroquine, increased, particularly in the PICU. The use of ceftriaxone and teicoplanin, which were also prescribed at admission in severe COVID-19 cases, doubled in the PICU in April 2020 compared with April 2019. Other than ceftriaxone, antibiotics for community-acquired infections were prescribed less than in the same period in 2019, and cefazolin use decreased due to the dramatic drop in the number of surgeries. In contrast, the use of most broad-spectrum anti–gram-negative

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