PEDIATRIC OTORHINOLARYNGOLOGY AND COVID-19

Guideline of clinical practice of the French Association of Pediatric Otorhinolaryngology (AFOP) and of the French Society of Otorhinolaryngology (SFORL).

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Prevalence of SARS-CoV-2 infection in the child

- Cases are much rarer than in adults. In a Chinese series of 44,672 confirmed cases, only 2% of patients were under 19 years of age and 0.9% under 10 years of age [1]. Similar percentages were observed in Korea [2], Italy [3], in the United States [4].
- The infection may occur at any age, the median age reported is 7 years [5–7].

Transmission/contagiousness

- As in adults, direct, human-to-human transmission is the result of the projection of droplets, by hand contact or via an inert surface. The virus is viable for up to several days depending on surfaces (plastic 72 hours and stainless steel 48 hours)

- Young children tend to touch everything and it is advisable to regularly disinfect all surfaces in offices and consultation rooms, as well as hospital rooms for children. Conventional disinfection methods are effective [8].
- Stools are potentially contaminating. Young children do not have the same hygienic reflexes as an adult, thus it is recommended to clean all the surfaces having potentially been in contact with a contaminated child (bowl rim, flush button, door handle, etc…) after toilet use. Although viral RNA has been found in the stool, no oro-fecal transmission has yet been documented [9,10].
- No case has been described of maternal-fetal transmission of the virus in pregnant women infected with SARS-CoV-2 [11,12].
- Incubation time in children varies from 2 to 10 days [13]. Concerning the duration of contagiousness, there is no specific paediatric data. In adults, the median duration of presence of viral RNA in upper respiratory secretions is 10.5 days (6-12 days) [14] and it is usual practice to quarantine subjects for 15 days. The same attitude is thus recommended in Covid-19 positive children.

Symptoms and prognosis

- The symptoms are the same as in adults, except anosmia and ageusia which are less often reported by young children.
- According to the Chinese paediatric series [5], prognosis is good since 90% of children were asymptomatic or paucisymptomatic, 5.2% with oxygen desaturation and only 0.6% with acute respiratory distress. However, younger

children appear to be the most likely to develop severe forms [5]. The earliest symptomatic case reported is that of a 55-day-old child [15].

- So far, no deaths of children have been reported in Italy or China [4–6,16].

Diagnosis

- The usual lab workups can show biological abnormalities such as lymphopenia and elevated CRP
- Concerning the sensitivity of RT-PCR on nasopharyngeal samples, there is no specific paediatric data , but it has been shown to be 60% in adults [17,18].
- The chest CT-scan, however, has a sensitivity of over 90%, the first lesions appearing being pulmonary nodules [18]. The CT-scan was abnormal for all severe forms of SARS-CoV-2 infections in children [19].

Precautions in the clinic

- **Indications of face-to-face consultations should be limited to the following cases:**

- Emergencies

- Mandatory clinical examination in order to offer proper medical or surgical management

- Indispensable post-operative care

Ideally, a dedicated space should be reserved to perform the procedure, with as little material as possible to facilitate cleaning between each exam

- **Flexible naso-endoscopy and laryngoscopy**

Indications should be limited as much as possible well tolerated and this exam should be performed with very struct precautions:

- Personal Protective Equipment (PPE): FFP2 mask, overcoat, cap, protective glasses. All of this equipment should immediately be thrown into dedicated infected waste bins in the examination room except for the protection glasses that can be decontaminated and reused.

- The flexible endoscope should be placed on a clearly separate table; the camera connected to the endoscope should have a protective cover.

- An endoscope sheath should be used. After removal, a thorough cleansing of the entire endoscope, including the proximal areas that have not been in direct contact with the nasal cavity, is necessary. An alternative to the use of sheaths is the decontamination of the endoscope after each use, following the usual decontamination procedures.

- Thorough cleaning of all surface areas of the examination room.

- A delay of at least 30 min should be given before reusing this room for another patient.

- Local anaesthesia with lidocaine spray is not recommended.

Newborn hearing screening

-Newborn hearing screening is authorized if practiced by staff not working directly with COVID 19 positive patients and if the mother is asymptomatic. The protection of the tester should include: surgical mask, surgical hand scrubs before and after each test; the gloves should be taken off after each test. The equipment should be decontaminated after use.

-Special care should be taken not to lose track of children who have to be retested after discharge from maternity. A list of children who have to be tested again after the crisis is over should be established

Medical treatments

- **Saline nasal irrigation** should be limited to decreasing nasal blockage, especially in infants. No particular precaution should be taken at home because, even in the absence nasal irrigation, an infected child has a high risk of contaminating his siblings and his parents.In the hospital, the risk is to contaminate staff

caregiver, therefore precautions should be implemented in this context: wearing a surgical mask, gloves, goggles, a gown

- Regarding **corticosteroids**, no data suggests a particular risk or benefit of this type of treatment in the COVID-19 context. However, we recommend limiting their prescription to the most useful indications, such as severe acute facial paralysis (Grade 5 or 6 of the House Brackmann classification) and sudden sensorineural hearing loss greater than 60 dB. In such cases, a one-week course of oral corticosteroids is possible. The initiation or continuation of nasal corticosteroids should be decided on a case-by-case basis. Corticosteroid inhalations already given as long-term therapy, in particular for severe asthma, should be continued. On the other hand, the introduction of new treatments using corticosteroids inhalations should be avoided as much as possible because of the potential risks of viral dissemination to the lower airway. Thus, in case of laryngeal croup, a prescription of systemic corticosteroids is preferable to nebulization.

Surgery

- **Indications** should be limited to procedures that cannot be postponed for more than 2 months and for which there is no medical therapeutic alternative. In difficult cases (cholesteatoma, tonsil hypertrophy with severe OSAS,…), the decision to maintain or to postpone surgery should ideally be discussed collectively with a written decision recorded in the medical file.

- **Tonsillectomy or adenoidectomy in severe OSAS**

Indications should be limited as much as possible, as the salivary secretions, the nasopharynx and probably the tonsil tissues (virus tropism for lymphocytes) have a high viral load. In case of urgent therapeutic indication, tonsillectomy should be preferred to non-invasive ventilation, the latter being at high risk for viral dissemination in the ambient air and requiring a hospital bed, often in ICU, for several days. There are no data regarding the relative risks of different tonsillectomy techniques. The use of instruments causing tissue vaporization could theoretically promote viral dissemination in the operating room atmosphere.

- **Endonasal surgery**

Indications should be drastically limited because of the high viral load present in the nasal cavities and the risk of dissemination of viral particles in the OR atmosphere. Examples of indications that could be maintained are bilateral choanal atresia and cases of congenital piriform aperture stenosis which are poorly tolerated despite optimal medical treatment. Microdebriders and drills should be avoided as much as possible. Surgeries such as can be maintained.

- **Tympanic ventilation tubes**

The putative presence of the virus in the otitis effusion is not yet documented. However, the procedure should not be maintained during the COVID-19 pandemic as it is considered non-urgent.

- **Tympanoplasties for retraction pockets and cholesteatomas**

Indications should be discussed on a case-by-case basis depending on the extensions and possible complications (meningeal exposure, labyrinthine fistula, facial paralysis,…). Postponement is possible in the vast majority of cases.

- **Airway endoscopies for suspected foreign bodies aspiration.**

Three situations must be distinguished:

- Strong clinical suspicion of foreign body (parents have witnessed the aspiration of a foreign body, initial choking, persistent cough or dyspnea): the indication for tracheobronchial endoscopy should be maintained without prior CT-scan.

- Doubtful cases (initial choking without subsequent clinical anomaly, or no initial choking but clinical persistent symptoms such as cough, dyspnea, asymmetric auscultatory abnormalities, without any associated fever): chest CT-scan is recommended, after which, tracheobronchial endoscopy is performed if the CT-scan reinforces suspicion (visualisation of the foreign body; unilateral expiratory trapping; systematized ventilation anomalies);

the radiologist may then also check the CT-scan for pneumological signs in favour of a Covid-19.

- When the suspicion level of inhaled foreign body is very low (no initial choking, no suggestive persistent clinical anomalies), no CT-scan nor tracheobronchial endoscopy is recommended.

• Other indications for airway or oesophagus endoscopy should be maintained:

- Button battery ingestions (oesophagus, nasal cavity)

- Caustic ingestions

- Repeated extubation failures, after discussion with neonatologists or intensivists

○ **Tracheostomy**

-Very few indications should be maintained, and they should be discussed on a case-by-case basis due to a high risk of dissemination of viral particles during the procedure and also subsequently during post-tracheostomy care

○ **ENT oncological surgery**

Indications of biopsies or surgical removals should be maintained

○ **Mastoiditis, complicated sinusitis, cervical or peripharyngeal abscesss**

- Exclusive medical treatment based on intravenous antibiotic therapy guided by bacteriological samples should be preferred. Any easily accessible suppurative fluid (suppurative otitis, retro-auricular abscesses, neck abscesses) should be sampled using nitrous oxide as an analgesic technique

- If surgery cannot be avoided, external approaches should ne preferred to endoscopic procedures as far as possible (e.g.: drainage of the frontal sinus through external approach; Lynch approach for acute ethmoiditis with orbital abscess).

- **Preoperative workup to test for COVID-19**

-**Nasopharyngeal swab with RT-PCR** ideally performed less than 24 hours before surgery is useful in spite of the 30 to 40% of false negative results. Urgent procedures should not be delayed by the expectancy of the results.

-The sensitivity of thoracic CT-scan is above 90%. If a CT-scan is required in the usual preoperative assessment (mastoiditis, complicated sinusitis, cervical or peripharyngeal abscess, tumours), a complementary chest CT-scan must systematically be done. In other situations, discussion should be made on a case-by-case basis according to age, symptoms and CT-scan availability.

In case of preoperative diagnosis of Covid-19 infection, non-urgent surgeries should be postponed for at least 15 days (usual duration of quarantine in infected subjects)

- **Precautions during surgery**

Systematic precautions should be taken for all procedures and whatever the patient Covid-19 status. Some procedures are particularly at risks of contamination of the staff members present in the OR: mask ventilation, intubations and extubations, endoscopies, endonasal surgeries, adenoidectomies and tonsillectomies.

-The number of operators in the operating theatre should be kept minimal

- Procedures should be performed as rapidly as possible by the most experienced surgeons of the team

-PPE should encompass protective goggles and a mask for all staff members present in the OR. The FFP2/N95 mask model is compulsory when the patient is COVID-19 positive. In other cases, some teams systematically wear this model while others reserve it for selected cases, depending on the locally available stocks, on the patient's symptoms and on the type of surgical procedure. Dive masks or face protection shields can also be useful.

-If possible, particularly for the procedures with high risks of contamination, the surgery should be performed in a negative pressure operating room with an air filtration/purification system.

- When possible, continuous suction should be placed near the operating field

- Techniques favouring the dissemination of infected tissue micro-fragments in the OR should be avoided as much as possible: drilling, microdebrider and possibly also monopolar electrocoagulation, laser, radiofrequency and coblation.

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