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1 **Clinical characteristics of COVID-19 infection in polyhandicapped persons in France**

2 Short title: Clinical characteristics of COVID-19 infection in polyhandicapped persons

3

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35

36 **Abstract**

37 **Aim.** Little is known about the clinical profile of COVID-19 infection in  
38 polyhandicapped persons. This study aimed to describe the characteristics of this  
39 infection among individuals with polyhandicap.

40 **Method.** This was a retrospective observational study. Polyhandicap was defined by the  
41 combination of motor deficiency, profound mental retardation, and age at onset of  
42 cerebral lesion younger than 6 years. A positive COVID-19 status was considered for  
43 patients with a positive COVID-19 laboratory test result, or patients presenting with  
44 compatible symptoms and living in an institution or at home with other patients or  
45 relatives who had laboratory-confirmed COVID-19 infection. Data collection included  
46 sociodemographic data, clinical and paraclinical characteristics, as well as the  
47 management and treatment for COVID-19 infection.

48 **Results.** We collected 98 cases, with a sex ratio of 0.98 and a mean age of 38.5 years  
49 (3 months to 73 years). COVID-19 infection was paucisymptomatic in 46% of patients,

50 20.6% of patients presented with dyspnea, while the most frequent extra-respiratory  
51 symptoms were digestive (26.5%) and neurological changes (24.5%); 18 patients  
52 required hospital admission, four adults died. The mean duration of infection was longer  
53 for adults than for children, and the proportion of taste and smell disorders was higher in  
54 older patients.

55 **Conclusion.** These findings suggest that PLH persons often develop paucisymptomatic  
56 forms of COVID-19 infection, although they may also experience severe outcomes,  
57 including death. Clinicians should be aware that COVID-19 symptoms in PLH persons  
58 are often extra-respiratory signs, mostly digestive and neurologic, which may help in the  
59 earlier identification of COVID-19 infection in this particular population of patients.

60 **Keywords:** polyhandicap, COVID-19, clinical characteristics, death

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### 63 **List of abbreviations**

64 FIM Functional Independency Measure

65 IQR interquartile ranges

66 MD missing data

67 PLH polyhandicap

68 SD standard deviation

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## **1. Introduction**

Polyhandicap (PLH), as a recently defined concept [1–3], is a serious health condition with severe and complex disabilities corresponding to a chronic disorder occurring in an immature brain, which leads to a combination of profound intellectual disability and serious motor disorder and results in an extreme restriction of autonomy and communication. These neurological, intellectual, and motor disabilities are frequently accompanied by sensory deficits and behavioral and relational disorders. This term is similar to the notion of “profound intellectual and multiple disabilities,” which is used in other countries but does not systematically refer to a disorder affecting an immature brain [4]. The prevalence of polyhandicap in France is estimated to be between 0.7 and 1.28 per thousand, i.e., 880 new cases of children with polyhandicap per year [5–7]. Persons with PLH have numerous comorbidities, and the main cause of death among these patients is respiratory failure after recurrent pulmonary infections resulting from a combination of different factors (including scoliosis with thoracic deformation, swallowing disorders, gastroesophageal reflux disease, insufficient bronchial drainage measures, and transit disorders, etc.) [8–12]. Since the beginning of the COVID-19 pandemic, a variety of manifestations have been reported both in adults and children, and a greater frequency of complications and death from COVID-19 infection has been widely documented in patients with chronic pathologies and comorbidities as well as in people over 70 years of age [13]. It is therefore reasonable to study the consequences of COVID-19 infection in polyhandicapped patients. This issue led a group of physicians in France specializing in polyhandicap to conduct an observational study on COVID-19 infection in this population of patients so as to identify the specific characteristics of the infection among patients with polyhandicap (respiratory and extra-respiratory symptoms) and the occurrence of complications (severe forms) and death. These

96 findings will help medical teams perform a prompt diagnosis of this infection and optimize  
97 their care management and hospital discharge as most of these patients live in  
98 nonmedicalized institutions and sometimes at their parents' homes. The aim of this study  
99 was to describe (i) the clinical profile of the COVID-19 infection and (ii) the occurrence of  
100 complications and death in this fragile population of patients.

101

## 102 **2. Method and participants**

103 Data were collected retrospectively through a questionnaire form that was sent to  
104 practitioners working in specialized institutions and rehabilitation centers for PLH persons  
105 and to practitioners of pediatric/neurologic university hospitals. Practitioners retrieved  
106 information from the patient files and answered the questionnaire with the information they  
107 obtained.

### 108 **2.1 Selection criteria**

109 We chose to target people with polyhandicap defined by the combination of motor  
110 deficiency (quadriplegia, hemiparesis as a predominant hemibody motor impairment,  
111 diplegia, extrapyramidal syndrome, cerebellar syndrome, and/or neuromuscular problems)  
112 and severe/profound mental impairment (intelligence quotient <40; for patients older than 5  
113 years: IQ= developmental age below 2 years old; for children 3–5 years old: IQ=  
114 developmental quotient <40% or not assessable) associated with everyday life dependence  
115 (Functional Independence Measure <55) and restricted mobility (Gross Motor Function  
116 Scale [GMFCS and GMFCS-ER], III, IV and V [14]) with age at onset of cerebral lesion  
117 below 6 years.

118 COVID-19-positive status was accepted if the patient had a positive COVID-19 laboratory  
119 test result (reverse-transcriptase polymerase chain reaction [RT-PCR]), if the patient had  
120 compatible symptoms for COVID-19 care and lived in an institution where at least two

121 patients had COVID-19 infection confirmed by laboratory tests, or if a patient with  
122 compatible symptoms for COVID-19 lived with relatives (parents, siblings) who had a  
123 diagnosis of laboratory-confirmed COVID-19 infection (in accordance with the French  
124 Health Policy recommendations).

125 The parents and/or legal representative received written information on this observational  
126 study, and their non-opposition to the use of their child's health data was collected. This  
127 study followed the STROBE guidelines.

128

## 129 **2.2 Data collection**

130 The following patient characteristics at baseline were collected:

131 Sociodemographic data: gender, age, type of care (specialized rehabilitation centers,  
132 residential facility, or home care), and geographic area.

133 Etiologies for polyhandicap: unknown etiology; known etiology: constitutional or acquired.

134 Main comorbidities: epilepsy (yes/no), swallowing disorders (yes/no), orthopedic (scoliosis  
135 with thoracic deformation), pulmonary (recurrent pulmonary infections: up to 3/year, patient  
136 receiving respiratory treatments [aerosols, beta-2 mimetics]) and digestive (gastroesophageal  
137 reflux disease and the need for enteral nutrition).

138 COVID-19 infection diagnosis: laboratory test (RT-PCR, institutionalized patient, and home  
139 cluster).

140 Clinical features of COVID-19 infection in polyhandicapped patients: general symptoms  
141 such as occurrence of fever and mean fever degree as well as increased swallowing  
142 disorders; respiratory symptoms: dyspnea, hypoxia, findings of pulmonary auscultation  
143 (lung consolidation, diffuse bronchial congestion); extra-respiratory signs: neurological  
144 symptoms (modification of consciousness or behavioral modifications), epileptic seizure or  
145 increased frequency of epileptic seizures in epileptic patients, when evaluable, difficulty

146 with sense of smell or taste; digestive symptoms (diarrhea, vomiting) and cutaneous  
147 disorders appearing during the COVID-19 infection. Paucisymptomatic presentation of  
148 COVID-19 infection was defined as patients presenting only mild symptoms (slight  
149 elevation of temperature (<38.5°C), tympanic inflammation, throat redness, nasal  
150 congestion) without respiratory symptoms.

151 The paraclinical features (imaging and blood tests) of COVID-19 infection in  
152 polyhandicapped patients: findings on chest X-rays (lobe consolidation, diffuse bronchial  
153 infiltration). Occurrence of ground-glass opacities on chest computerized tomography  
154 (CCT) [15]. Abnormal blood test results (lymphocytopenia, neutropenia) and higher C-  
155 reactive protein (CRP) levels were observed during COVID-19 infection.

156

157 Therapies and care management of COVID-19 infection: main treatment prescribed  
158 (antibiotic treatment, hydroxychloroquine, oxygen therapy) and the need for noninvasive  
159 mechanical ventilation. Care management: transfer to a medicalized structure (hospital  
160 discharge, admission to an intensive care unit [effective or required but declined]).

161 Patient outcome after COVID-19 infection: death or deterioration of health status defined by  
162 weight loss. Comparisons were made between patients under and over 50 years of age since  
163 in the general population people aged over 50 are considered at higher risk of a severe  
164 outcome after COVID-19 infection ([https://www.has-sante.fr/jcms/p\\_3240076/fr/covid-19-  
165 quels-leviers-pour-vacciner-plus-vite-les-personnes-les-plus-vulnerables](https://www.has-sante.fr/jcms/p_3240076/fr/covid-19-quels-leviers-pour-vacciner-plus-vite-les-personnes-les-plus-vulnerables)).

## 166 **2.2 Ethics**

167 Regulatory monitoring was performed according to the French law that requires the approval  
168 of the French ethics committee (*Comité d'éthique de la recherche de la Société Française de*  
169 *Pédiatrie*: CERSFP\_2020\_118). This study was registered on the AP-HM anonymous health  
170 data portal, PADS20-108.



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172

### 173 **2.3 Statistical analysis**

174 Statistical analyses were performed using SPSS software (IBM SPSS PASW Statistics Inc.,  
175 Chicago, IL, USA). Qualitative variables are presented as number and proportion for the two  
176 groups. Quantitative variables are presented as mean, standard deviation, median, and 25th  
177 and 75th percentiles. Depending on the distribution of the variables, chi-squared or Fisher's  
178 exact tests were used for qualitative variables. Comparisons between the two groups were  
179 made with the usual tests (Student's *t* test, ANOVA) and nonparametric tests (Mann–  
180 Whitney, Kruskal–Wallis) according to the applicability of these different tests.

181

## 182 **3. Results**

### 183 **3.1. General characteristics of the patients**

184 Between April 1, 2020 and July 1, 2020, we collected a total of 98 questionnaire forms from  
185 patients who met the COVID-19 criteria. The first cases of COVID-19 occurred in March  
186 2020, and the last cases occurred in June 2020. The diagnosis of COVID-19 infection was  
187 based on (i) laboratory tests for 79.6% of the patients, (ii) cluster of institutionalized patients  
188 as defined previously for 17.3% of the patients, and (iii) home cluster for 3.1% of the patients.

#### 189 **3.1.1 Etiologies**

190 Etiologies of polyhandicap were unknown for 30.6% of the cases. Among the known  
191 etiologies, 48.4% ( $n=33$ ) were constitutional: 4.4% ( $n=3$ ) of the patients presented with  
192 central nervous system malformations, 35.2% ( $n=24$ ) of the patients presented with  
193 neurometabolic or neurogenetic diseases, 8.8% ( $n=6$ ) of the patients presented with epileptic  
194 encephalopathy, and 51.6% ( $n=35$ ) presented with an acquired disease (see **Table 1** for  
195 details).

196 3.1.2 Main comorbidities

197 The frequency of associated comorbidities in decreasing order was as follows: epilepsy 56.1%  
198 ( $n=55$ ), swallowing disorders 40.8% ( $n=40$ ), scoliosis 16.3% ( $n=16$ ), gastroesophageal reflux  
199 13.4% ( $n=13$ ), and recurrent pulmonary infections 6.1% ( $n=6$ ). Overall, 12.2% ( $n=12$ )  
200 received enteral nutrition and 5.1% ( $n=5$ ) received baseline respiratory treatments (see **Table**  
201 **1** for details).

202 3.1.3 Health characteristics of COVID-19 infection

203 COVID-19 infection was paucisymptomatic in 46% of the patients ( $n=45$ ), and all of them  
204 had a positive PCR result. Fever was the most constant symptom (68.4%;  $n=67$ ). The most  
205 frequent respiratory symptoms were dyspnea (20.6%,  $n=20$ ), hypoxemia (28.9%,  $n=28$ ), and  
206 bronchial congestion (21.6%,  $n=21$ ). The most frequent extra-respiratory symptoms were  
207 digestive symptoms (diarrhea/vomiting) 26.5% ( $n=26$ ), followed by neurological symptoms,  
208 modification of consciousness and/or behavior 24.5% ( $n=24$ ), difficulty with taste and smell  
209 11.8% ( $n=10$ ), and increased epileptic seizures or epileptic seizures appearing in nonepileptic  
210 patients, 1% ( $n=3$ ). See **Table 2** for details.

211 3.1.4 Paraclinical features

212 Only 9.8% ( $n=8$ ) of the patients had a chest X-ray (the main radiologic abnormalities were  
213 lobe consolidation or diffuse infiltration), and only 12.5% ( $n=10$ ) of the patients had CCT,  
214 showing specific COVID-19 changes in all cases. The main laboratory abnormalities were, in  
215 decreasing order, elevated C-reactive protein (CRP) levels, lymphopenia and neutropenia (see  
216 **Table 2** for details).

217 3.1.5 Treatment and care management for COVID-19 infection

218 The main treatment modalities for COVID-19 infection were antibiotic treatments in 36  
219 patients (37.1% of cases), and the most frequently used antibiotic was azithromycin; one third

220 of the patients received oxygen therapy, and only two patients needed noninvasive mechanical  
221 ventilation.

222 Overall, 18 patients (18.3%) required hospital admission, five needed intensive care unit  
223 (ICU) admission (one of them was not admitted to the ICU), and four patients died. All  
224 deceased patients were adults, with an age range of 21–63 years. Three of these patients were  
225 men, none were prone to episodes of recurrent pulmonary infections, one had scoliosis, and  
226 two had swallowing disorders. All deceased patients presented with respiratory symptoms,  
227 and two of them had an altered state of consciousness. After the onset of COVID-19 infection,  
228 one third of the patients experienced weight loss (see **Table 2** for details).

### 229 **3.2 Comparison between boys/men and girls/women**

230 There was no significant difference in patient gender in terms of general health  
231 characteristics, comorbidities, therapies and care management, and patient outcomes. COVID-  
232 19 symptoms did not differ by gender except for digestive troubles, which were significantly  
233 more frequent in girls than in boys (see **Table 3** for details).

234

### 235 **3.3 Comparison between adults and children and between older (over 50 years) and** 236 **younger (under 50 years) patients**

237 There was no significant difference between children and adults and between older and  
238 younger patients for general health characteristics, comorbidities, COVID-19 symptoms,  
239 therapies, and care management. The mean duration of COVID-19 infection was significantly  
240 longer for adults than for children, and the proportion of taste and smell disorders was  
241 significantly higher in older (over 50 years old) than in younger patients (see **Tables 4 and 5**  
242 for details).

243

## 244 **4. Discussion**

245 Despite the increasing number of COVID-19 infections in the general population, little is  
246 known about the clinical profile of the disease in people with PLH. However, PLH persons  
247 are a vulnerable population who are potentially susceptible to adverse coronavirus 19  
248 infection (COVID-19) outcomes as a consequence of their underlying severe chronic health  
249 condition. The proportion of patients with an unknown etiology for the polyhandicap (30%)  
250 was similar to the proportion reported in previous studies, which ranged from 15 to 60% [2].  
251 Our population of patients had a high prevalence of specific comorbidities, such as epilepsy as  
252 well as scoliosis with thoracic deformation and swallowing disorders inducing respiratory  
253 problems, which are identified as risk factors for poor outcomes of COVID-19 infections [16].  
254 Not surprisingly, the patients came from the French geographic areas most affected by the  
255 epidemic (northern and central and south-eastern), and most patients were cluster cases in  
256 institutional settings.

257 The first interesting finding is that the course of the disease was mild in 46% of PLH persons.  
258 This fact is surprising and unexpected in this fragile population with deteriorated health  
259 conditions and numerous associated comorbidities. Despite the nationwide character of this  
260 study, we report a limited number of pediatric cases, which is consistent with published data  
261 reporting that children are less likely to be symptomatic or to develop severe symptoms  
262 compared with adults [17]. The main symptom of COVID-19 infection in PLH patients was  
263 fever (almost 70% of cases), and a quarter of the patients presented with respiratory  
264 symptoms. A quarter of the patients presented with extra-respiratory symptoms (digestive  
265 [diarrhea, vomiting] and neurologic [altered state of consciousness or behavioral  
266 modifications, and epilepsy]), whereas cutaneous disorders were found in only 5% of the  
267 patients. We observed some similarities between COVID-19 clinical features in PLH and  
268 older patients such as paucisymptomatic expression and digestive symptoms [18]. The low  
269 proportion of smell and taste disorders (12%) may be explained by under/misdiagnosis, which

270 was due to the very low communication ability of the patients, making their evaluation  
271 challenging.

272 We did not find any gender difference for the severe forms of COVID-19 infection in PLH  
273 patients. These results differ from results reported for the general population, which usually  
274 show a higher proportion of severe forms in men [19]. The only difference observed for  
275 COVID-19 symptoms between the genders was an unexplained higher proportion of digestive  
276 symptoms in women (35.4%).

277 We did not observe any differences in the clinical characteristics of COVID-19 infection  
278 across children and adults or between younger and older patients, except for a higher  
279 proportion of taste and smell disorders in older patients and a longer duration of COVID-19  
280 infection in adults compared with children, which is consistent with the findings of previous  
281 studies reporting that children often have COVID-19 infection with low-to-moderate  
282 symptoms [17]. Although aging is associated with severe forms of COVID-19 infection, we  
283 did not find any difference between younger/children and older/adult patients for the severe  
284 symptoms of COVID-19 infection. However, all fatal cases in our study were adults; but the  
285 mean young age of our patients (38 years) may partly explain the relatively “low frequency”  
286 of fatalities in this fragile population of patients. Another explanation may be that older PLH  
287 patients do not have exposure to certain cardiovascular and cancer risk factors (tobacco and  
288 alcohol) and have a very low incidence of chronic diseases such as cancer, diabetes, and  
289 cardiovascular diseases [20]. Previous studies have found that people with intellectual  
290 disability had poorer COVID-19 outcomes [21]; in fact, our results reveal that nearly 20% of  
291 patients needed hospital admission for respiratory symptoms corresponding to severe forms of  
292 COVID-19 infections, and 5% developed critical disease with resuscitation offered. Four  
293 patients in our study died of COVID-19 infection, all of whom were adults; surprisingly, they  
294 did not present with pulmonary comorbidities at baseline. The case fatality rate of COVID-19

295 infection among PLH persons in our study was lower (4%) than the death rate among people  
296 with intellectual or developmental disability, varying from 5% in the United States (New  
297 York State) to 13% in The Netherlands [19]. However, COVID-19 infection had an impact on  
298 patient outcome, with a median duration of COVID-19 infection of 9 days, and a significant  
299 proportion of patients (40%) presented with weight loss after the infection.

300 A rather high proportion (37%) of patients received antibiotic treatments; this finding may be  
301 explained by the intention of the clinician to prevent bacterial super-infection and subsequent  
302 aggravation in these fragile patients. The study was not designed to investigate the modalities  
303 of virus transmission or the prevalence of infection in this population. Contrary to what was  
304 observed in institutions for dependent older people, we did not observe significant clusters of  
305 infection in institutionalized PLH patients. A specific study of the transmission of the virus to  
306 people with PLH would be useful.

307 This study shows that PLH patients are vulnerable to COVID-19 infection and should  
308 therefore be considered at high risk of severe forms of COVID-19, and appropriate measures  
309 should continue to be taken to protect them. The low mortality of COVID-19 infection in our  
310 population of PLH patients suggests that hospital care management is useful in these patients  
311 with severe forms. This outcome does not exclude the question of the level of management  
312 adapted to each patient on a case-by-case basis. As previously demonstrated for children with  
313 physical disabilities, it is important to maintain the medical care and rehabilitation adapted to  
314 the complex needs of PLH persons during this health crisis in order to prevent increased  
315 health deterioration [22].

316 The present study has several limitations. First, our analysis was based on a retrospective  
317 study, which might lead to bias and limit the generalizability and reliability of our results.  
318 Second, our results do not represent the general population of PLH patients but instead

319 represent mostly patients cared for in institutions, as we could not make contact with all  
320 practitioners specializing in polyhandicap in France.

## 321 **5. Conclusion**

322 The findings of this study suggest that PLH persons often develop paucisymptomatic forms of  
323 COVID-19 infection, although they may also have severe outcomes, including death.

324 Clinicians should be aware that the presenting symptoms of COVID-19 in PLH persons are  
325 often extra-respiratory signs, mostly digestive and neurologic, which may help in the earlier  
326 identification of COVID-19 infection in this particular population of patients.

## 327 **Acknowledgments**

### 328 **French PLH and Covid Observatory Group:**

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## 332 **Conflicts of interest**

333 The authors state that they have no conflict of interest.

334

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399 **Table 1. Sociodemographics and health status of polyhandicapped persons (N=98)**

		<i>N (%)</i>	<b>MD %</b>
<b>1) Sociodemographics</b>			
Sex ratio	Men/women	0.98	3 (3.1)
Age	Mean±SD	38.5±18.3	0 (0)
Children/adults		18/80	0 (0)
Care modality/structure	Spec. re-educ. center	20 (20.5)	12
	Residential facility	57 (58.1)	(12.2)
	Home care	9 (9.4)	
Geographical area	Île-de-France	49 (50)	0 (0)
	Hauts-de-France	24 (24.5)	
	Provence-Alpes-Côte d'Azur	23 (23.5)	
	Bourgogne-Franche-Comté	1 (1)	
	Normandie	1 (1)	
<b>2) Etiology</b>			
	Unknown	30 (30.6)	0 (0)
	Constitutional	33 (33.7)	
	Pre-perinatal	21 (21.4)	
	Postnatal	14 (14.3)	
<b>3) Comorbidities</b>			
Epilepsy	Presence of epilepsy	55 (56.1)	0 (0)
Swallowing disorders		40 (40.8)	0 (0)
Orthopedic	Scoliosis	16 (16.3)	0 (0)
Pulmonary	Recurrent pulm. infections	6 (6.1)	0 (0)
	Respiratory treatments	5 (5.1)	0 (0)

Digestive	Gastroesophageal reflux	13 (13.4)	0 (0)
	Enteral nutrition	12 (12.2)	0 (0)
<b>4) Diagnosis of COVID-19 infection</b>			
	RT-PCR	78 (79.6)	0 (0)
	Institution infection*	17 (17.3)	
	Familial infection**	3 (3.1)	

400 \* Patient with compatible symptoms for COVID-19 cared for in an institution where at least  
401 two patients had a COVID-19 infection confirmed by a laboratory test.

402 \*\* Patient with compatible symptoms for COVID-19 living with relatives (parents, siblings)  
403 having a diagnosis of laboratory-confirmed COVID-19 infection.

404 MD: Mean deviation; RT-PCR: reverse transcriptase-polymerase chain reaction

405 **Table2. Health characteristics of COVID-19 infection in polyhandicapped persons**  
 406 **(N=98)**

<b>Health characteristics of COVID-19 infection</b>		<b>N (%)</b>	<b>MD %</b>
<b>Paucisymptomatic forms*</b>		45 (46)	0 (0)
<b>1) General symptoms</b>			
Fever		67 (68.4)	0 (0)
Mean temperature level	Mean±SD	38.8±0.5	0 (0)
Increased swallowing disorders			
<b>2) Respiratory symptoms</b>			
Dyspnea		20 (20.6)	1 (1)
Hypoxia		28 (28.9)	1 (1)
Bronchial congestion		21 (21.6)	1 (1)
Lung consolidation		11 (11.7)	4 (4.1)
<b>3) Extra-respiratory symptoms</b>			
Neurological	Increased epileptic seizures	3 (3.1)	0 (0)
	Modification of consciousness and behavior	24 (24.5)	0 (0)
	Taste/smell difficulty	10 (11.8)	0 (0)
Digestive	Vomiting/diarrhea	26 (26.5)	
Cutaneous		5 (5.1)	5 (5.1)
<b>4) Paraclinical features</b>			
Chest X-rays	Not performed	74 (90.2)	16 (16.3)

	Anormal chest X-rays	8 (9.8)	
CCT**	Not performed	70 (87.5)	18 (18.4)
	Common features of C19 in CCT**	10 (12.5)	
Lymphopenia		11 (11.1)	28 (28.6)
Neutropenia		4 (4)	
CRP higher level	Med. [IQR]	63 [15– 106]	
<b>5) Therapies and care management for COVID-19 infection</b>			
	Antibiotic treatment***	36 (37.1)	1 (1)
	Azithromycin	16 (16.3)	36 (36.7)
	Hydroxychloroquine	3 (3.1)	1 (1)
	Oxygen therapy	24 (24.5)	0 (0)
	Noninvasive mechanical ventilation	2 (2.1)	2 (2)
Hospital admission	Not required	80 (81.6)	0 (0)
	Required but declined	2 (2)	
	Hospital admission	16 (16.3)	
Intensive care unit admission	Not required	93 (95)	0 (0)
	Required but declined	1 (1)	
	ICU admission	4 (4.1)	
<b>6) Patient outcome</b>			
	Weight loss	32 (33.7)	3 (3.1)

	Death	4 (4.1)	0 (0)
<b>Duration of COVID-19</b>	Med. [IQR]	9 [14–15]	25 (25.5)
<b>infection onset</b>			

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407 \*Mild ORL symptoms (sore throat, nasal congestion, fever<38.5°C), no associated respiratory

408 symptoms

409 \*\*Chest computerized tomography

410 \*\*\*Except azithromycin

411

412 **Table 3. Comparison between genders for health characteristics, COVID-19 symptoms,**  
 413 **and outcomes**

<b>Patient characteristics</b>	<b>Girls/women N=</b> <b>48, n (%)</b>	<b>Boys/men N=</b> <b>47, n (%)</b>	<b>p</b>
<b>General characteristics</b>			
Children	6 (12.5)	11 (23.4)	0.1
Adults	42 (87.5)	36 (76.6)	
Unknown etiology	37 (77.1)	30 (63.8)	0.1
<b>Comorbidities at baseline</b>			
Epilepsy	25 (52.1)	30 (63.8)	0.2
Scoliosis	7 (14.6)	7 (14.6)	1
Recurrent pulmonary infections	1 (2.1)	5 (10.6)	0.1
Swallowing disorders	20 (41.7)	18 (38.3)	0.7
Gastroesophageal reflux	8 (16.7)	5 (11)	0.4
Enteral nutrition	3 (6.3)	8 (17)	0.1
<b>COVID symptoms</b>			
Pauci-symptomatic forms	20 (41.7)	24 (51.5)	0.3
Respiratory symptoms*	16 (33.3)	15 (32)	0.8
Altered state of consciousness	15 (31.3)	7 (15)	0.06
Digestive symptoms	17 (35.4)	8 (17)	<b>0.04</b>
Taste/smell difficulty	6 (14.3)	4 (9.5)	0.5
<b>Treatments and care management for COVID-19 infection</b>			
Hospital admission	8 (16.7)	6 (12.8)	0.6
Intensive care unit admission required	2 (5.7)	3 (8)	1

<b>Patient outcome</b>			
Weight loss	18 (37.5)	13 (29.5)	0.4
Death	1	3	
Duration of COVID-19 infection onset, M±SD	12.2±9.3	9.2±7.2	0.1

414 \*Dyspnea, hypoxia, lung consolidation, bronchial congestion

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416



417 **Table 4. Comparison between adults and children for health characteristics, COVID-19**  
 418 **symptoms, and outcomes**

<b>Patient characteristics</b>	<b>Children <i>N</i>= 18, <i>n</i> (%)</b>	<b>Adults <i>N</i>= 80, <i>n</i> (%)</b>	<b><i>p</i></b>
<b>General characteristics</b>			
Gender	Boys/men	11 (64.7)	0.2
	Girls/women	6 (35.3)	
Unknown etiology	4 (22.2)	26 (32.5)	0.4
<b>Comorbidities at baseline</b>			
Epilepsy	9 (50)	46 (57.5)	0.5
Scoliosis	5 (27.8)	11 (13.8)	0.1
Recurrent pulmonary infections	2 (11.1)	4 (5)	0.5
Swallowing disorders	9 (50)	3 (38.8)	0.3
Gastroesophageal reflux	4 (22.2)	8 (10)	0.1
Enteral nutrition	3 (16.7)	10 (12.7)	0.7
<b>COVID symptoms</b>			
Pauci-symptomatic forms	11 (61)	34 (42.5)	0.1
Respiratory symptoms*	5 (29.4)	28 (35)	0.7
Altered state of consciousness	4 (22.2)	20 (25)	1
Digestive symptoms	5 (27.8)	21 (26.3)	1
Taste/smell difficulty	0 (0)	10 (13.7)	0.3
<b>Treatments and care management for COVID-19 infection</b>			
<b>Care management</b>			
Hospital admission	2 (11.1)	14 (17.5)	0.7

Intensive care unit admission required	2 (11.1)	3 (5.3)	0.5
<b>Patient outcome</b>			
Weight loss	3 (17.6)	29 (37.2)	0.1
Death	0	4	
Duration of COVID-19 infection, M±SD	6±7.5	12±8.4	<b>0.02</b>

419 \*Dyspnea, hypoxia, lung consolidation, bronchial congestion

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422 **Table 5. Comparison between patients under and over 50 years of age for health**  
 423 **characteristics, COVID-19 symptoms, and outcomes**

<b>Patient characteristics</b>		< 50 years <i>N</i> = 61, <i>n</i> (%)	>50 years <i>N</i> = 34, <i>n</i> (%)	<i>p</i>
<b>General characteristics</b>				
Gender	Boys/men	27 (44.3)	20 (58.8)	0.1
	Girls/women	34 (55.7)	14 (41.2)	
Unknown etiology		20 (31.3)	10 (29.4)	0.8
<b>Comorbidities at baseline</b>				
Epilepsy		37 (57.8)	18 (53)	0.6
Scoliosis		12 (18.8)	4 (11.8)	0.3
Recurrent pulmonary infections		2 (3.1)	4 (11.8)	0.1
Swallowing disorders		23 (36)	17 (50)	0.1
Gastroesophageal reflux		8 (12.7)	5 (14.7)	1
Enteral nutrition		8 (12.5)	4 (11.8)	1
<b>COVID-19 symptoms</b>				
Pauci-symptomatic forms		30 (47)	15 (44.1)	0.8
Respiratory symptoms*		18 (28.6)	15 (44.1)	0.1
Altered state of consciousness		14 (22)	10 (29.4)	0.4
Digestive symptoms		18 (28.1)	8 (23.5)	0.6
Taste/smell difficulty		2 (3.8)	8 (25)	<b>0.005</b>
<b>Treatments and care management for COVID-19 infection</b>				
Hospital admission		11 (17.2)	5 (14.7)	0.7
Intensive care unit admission required		4 (7.7)	1 (4.3)	0.6

<b>Patient outcome</b>			
Weigh loss	17 (28)	15 (44.1)	0.1
Death	2	2	
Duration of COVID-19 infection onset, M±SD	11±9	10.5±7.8	0.8

424 \*Dyspnea, hypoxia, lung consolidation, bronchial congestion

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