Introduction

The SARS-CoV-2 pandemic is affecting both the physical and mental health of population worldwide, particularly the psychophysical balance of patients suffering from psychiatric diseases [1]. Here we present a case of a patient with Autism Spectrum Disorder (ASD) whose symptoms get worse following SARS-CoV-2 infection. The case we present is of particular interest because shows how the pandemic situation and the SARS-CoV-2 infection may together acting as a trigger affecting the symptoms of a psychiatric disorder making those worse.

Case presentation

We report a case of a patient with ASD who manifested increased hand stereotypies associated with vocal stereotypies, hyperactivity and altered sleep-wake rhythm when he was affected by SARS-CoV-2 infection. The patient is an 8-year-old child who presented low cognitive functioning and a severe level of autistic symptomatology, he attends the third year of elementary school with a teacher assistant, practicing psychomotor and speech therapy, integrated with PACT (Preschool Autism Communication Therapy). His mainly verbal expression is characterized by the use of single words on request, or spontaneously just in conditions of self-strong motivation, although the production of small, phrased utterances is also possible with proper stimulation. His social skills are poor, he shows difficult eye engagement and a low searching for others, difficulties in managing expectations and situations perceived as frustrating, with an implementation of behaviours sometimes reactive (crying, complaining, etc.). Personal autonomy is sufficient in the performance of activities of daily living. During the SARS-CoV-2 infection, patient’s mother noted a worsening of clinical symptoms. We observed a begin of stereotyped hand movements (flickering) accompanied by vocal stereotypies (repetition of colours) and also an increase in motor activity levels and an alteration in sleep-wake rhythm, with nocturnal awakenings and subsequent difficulty in falling asleep. Luckily, we observed a spontaneous remission of these symptoms a few days after his recovery from SARS infection. Currently persist only some stereotypies of the hands and vocal when emotional activation increase. Since then, the child has been monitored at our centre and although 9 months earlier he made access to our unit...
for evaluation of the behavioural, cognitive and adaptive pro-
files, because of those "events" we re-administered the same 
scales in order to report the differences observed. We observed 
a mainly difference on the Aberrant Behaviour Checklist Scale; 
in fact, if the child previous score was 10, in a phase of clinical 
equilibrium, after the SARS-CoV-2 infection his score was 18. 
Interestingly a main contribute to the new reported score was ob-
served in the subscales “Hyperactivity, lack of compliance” 
and “Stereotyped behaviours”. No major differences were observed 
in the other scales we used (Social Responsiveness Scale, Short 
Sensory Profile), except for the Vineland Adaptive Behaviour 
scale-II interview, that showed some improvements in daily life 
activities ascribable to the rehabilitation therapies underway.

Discussion

The SARS-CoV-2 pandemic, as reported, leads to a worsening 
of the incidence of psychiatric conditions in neurotypical chil-
dren [2] and to a worsening of symptoms in affected patients 
with psychiatric disorders [1]. As showed also patients with ASD 
may be affected by a worsening of behaviours, with an emer-
gence of anxious or depressive symptoms in relation to lock-
down. It is noteworthy a worsening of neurological symptoms 
in patients with pre-existing movement disorders [3]; similarly, 
infection with this virus itself can lead to neurological manifes-
tations in terms of movement disorders, such as myoclonus, 
ataxia and tremor [4]. In the case we presented, a Sars-CoV-2 
infection, in a child affected by ASD, has led to an increased ste-
reotyped behaviours, worsening of hyperactivity and altered 
sleep-wake rhythm.

ASD is a neurodevelopmental disorder, in accordance with 
the diagnostic criteria provided by the DSM-5, characterized by 
the presence of deficits in communication and social interaction 
and the presence of patterns of behaviour, interests or repeti-
tive activities [5]. With this regard, one of the main diagnostic 
signs of the “condition” is the presence of motor stereotypies 
which can be defined as repetitive, non-goal-directed, rhyth-
mic, patterned movements that stop with distraction and have 
no accompanying premonitory urge. Examples include hand 
flapping, body rocking, spinning, repetitive jumping, and finger 
flicking [6].

Although the diagnosis of ASD can be considered stable over 
time especially if made in the first years of life [7], individuals 
with ASD are exposed to a high rate of psychiatric comorbid-
ties, such as the most characteristic represented by attention-
deficit/hyperactivity disorder. Both conditions share a similar 
genetic basis and are associated with deficits in social skills and 
executive functions [8]. Moreover, sleep disorders are highly 
represented in ASD patients, especially night waking and in-
omnia, and so it is important to recognize this problem in a 
global assessment and intervene promptly [9]. Considering this 
we therefore hypothesize two explanations to justify the wors-
ening of symptoms observed. The first is based on the fact that 
it is well known how stressful events can affect the symptom-
atology of ASD, leading to their worsening. Some authors have 
already underlined the need to find any environmental stress-
ors, to provide a comprehensive assessment in the manage-
ment of such patients [10]. Of great interest is also how parental 
stress can influence the behavioural profile of ASD patients as 
some authors refer to this eventuality as “the spill over hypot-
hesis” [11]. Authors have reported how high levels of stress and 
anxiety in parents, as observed during the pandemic, can “spill 
over” to their children with ASD worsening their autism symp-
toms such as increased behavioural challenges, and decreased 
mental well-being of these children. The second hypothesis is 
based on neurobiological considerations regarding the infection 
by Sars-CoV-2. In fact, it has demonstrated that Coronavirus may 
activate dysregulated host immune responses. In particu-
lar, interleukin-6 is higher in subjects who have contracted the 
infection and, unfortunately this event is related to a worse out-
come [12]. Moreover, authors have hypnotized how viral infec-
tions and a dysregulation of the immune system could play a 
role in the etiopathogenesis of ASD [13,14] and how a higher 
interleukin-6 concentration is related to a worsening of restric-
tive and repetitive behaviours [15].

The unique case we presented hope will stimulate other re-
search on this topic with the aim of increasing specialist aware-
ness and so making a better diagnosis and the best manage-
ment of complex cases. It is important to remember that a 
clinical worsening in ASD may be due to an organic cause and 
not necessarily to the evolution of the pathology, even if it is a 
serious case.

Declarations

Data availability: The data used and or analysed during the 
current study are available from the corresponding author on 
reasonable request.

Conflicts of interest: The authors declare that they have no 
conflicts of interest. Authors’ Contributions All authors contrib-
equally to work.

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