

Single Case – General Neurology

# Amnesia of Uncertain Etiology in an Adolescent during COVID-19 Pandemic: A Case Report

Benedetta Basagni<sup>a</sup> Sonia Martelli<sup>b</sup> Anna Mazzucchi<sup>a</sup>  
Francesca Cecchi<sup>a, c</sup>

<sup>a</sup>IRCCS Fondazione Don Carlo Gnocchi-ONLUS, Florence, Italy; <sup>b</sup>IDIPSI, Parma, Italy;

<sup>c</sup>Department of Clinical and Experimental Medicine, University of Florence, Florence, Italy

## Keywords

Amnesia · Global psychogenic amnesia · COVID-19 pandemic

## Abstract

Sudden retrograde memory loss, in the absence of neurological causes, is usually referred to as a dissociative symptom. Dissociative amnesia, defined in the DSM-V as an inability to remember important autobiographical experiences, usually of a traumatic or stressful nature, is however a controversial phenomenon. Few cases with this pattern are described in the scientific literature and still fewer regarding adolescents. The objective of this study was to describe the case of an unexplained sudden memory loss that only partially fits with the criteria for dissociative amnesia, in a juvenile patient aged 16 years, which occurred during the COVID-19 lockdown. After the exclusion of any organic disturbances, 10 days after the clinical onset, a series of psychometric (neuropsychological and psychodiagnostics) tests were administered to the patient. Recent distress associated with COVID-19 lockdown was reported, while no previous significant distress or psychiatric history emerged during the clinical interview, conducted with the patient and parents. Severe disturbances in remote memory tests were registered, while no impairments in cognitive or anterograde amnesic functions were found or personality disorders. The disturbance was diagnosed as “amnesia of uncertain etiology.”

© 2022 The Author(s).  
Published by S. Karger AG, Basel

## Introduction

The DSM-5 considers *dissociative amnesia* as the inability to recall important autobiographical information, in the absence of neurological disorders and of any organic cause [1]. More specifically, the symptoms and criteria of dissociative amnesia are (a) an inability to recall important autobiographical information, usually of a traumatic or stressful nature, that is inconsistent with ordinary forgetting; (b) that causes significant distress in social, occupational, or other important areas of functioning; (c) not attributable to psychological effects of substances (e.g., alcohol or drugs), neurological, or medical condition and equally; (d) not better explained by other psychological disturbances such as (among others) post-traumatic stress disorder, neurocognitive disorders, traumatic brain injury, and factitious disorder. According to DSM-5, memory disturbances can be *localized* (failure to recall events during a circumscribed period of time), *selective* (patient can recall some, but not all parts of a circumscribed period of time or traumatic event), *systematized* (loss of memory for a specific category of information), *continuous* (loss of memory for each new event as it occurs), or *generalized* (acute onset of complete loss of memory for one's life history). More briefly, two kinds of dissociative amnesia are usually described: "situation specific," limited to a particular incident, and "global," related to large retrograde amnesic gaps of up to many years in personal identity, both considered to be related to psychotraumatic and/or stressful life-events [1, 2]. In particular, "situation-specific" amnesia is reported to arise in dramatic circumstances, including committing or being the victim of an offense, such as sexual abuse in childhood, while "global" amnesia seems to be related to three factors: (a) a severe, precipitating stress, (b) depressed mood immediately before the onset, and (c) a history of transient, organic amnesia from such causes as epilepsy, head injury, or alcoholic blackouts [1]. Several mechanisms have been proposed to explain the link between a stressful event and an episode of dissociative amnesia; Staniloiu and Markowitsch [3] listed several possible and not mutually exclusive, acting mechanisms inducing dissociative amnesic states; their hypothesis is that stress induces executive dysfunctions and motivational alteration, which in turn affect memory [4].

On the other hand, several memory scholars have criticized the very construct of dissociative amnesia [5]; in particular, some authors [6–8] show perplexity with respect to the diagnostic process of many cases described in the literature and believe that most of them are ambiguous, failing to definitely rule out plausible alternative explanations, such as everyday forgetfulness emerging after a trauma, ordinary forgetting and encoding failure, organic causes or malingering, or simply not thinking about something for a long time [6]. Moreover, pure dissociative amnesia should refer to a condition in which traumatic memories are stored but temporarily inaccessible, due to a dissociative coping mechanism, but there is still no clear evidence on whether the memory of a trauma can be stored and rendered inaccessible as a result of trauma itself [9]. Also, although exposure to distress should be considered a necessary trigger for the onset of memory disorder, a direct and universal connection between psychic distress or trauma and the amnesic symptomatology has not always been described in the cases presented in the literature; therefore, some authors prefer the term "pure retrograde amnesia" without psychogenic triggers [10]. Finally, even though the amnesic onset is defined as sudden, especially in localized dissociative amnesia cases, the temporal relationship with the reported traumatic/stressful triggers is not clear as symptoms have been reported to present after hours, days, or much longer after the traumatic or stressful event [7]. Thus, despite being an accepted DSM-V diagnosis, there is an ongoing debate among the scientific community surrounding the idea of dissociative amnesia so that nowadays, many regards it as a controversial memory phenomenon [5]. Indeed, the use of the more cautious terminology "unexplained memory loss" or "amnesia of uncertain etiology" has been recently recommended for cases in which it is not possible to formulate with absolute certainty a diagnosis of the dissociative syndrome [7].

Few cases are described in the scientific literature with sudden retrograde memory without an organic cause and still fewer in adolescents. Reinhold and Markowitsch [11] described two female juvenile patients that were examined with neuropsychological tests to assess basic and higher emotional processing functions; the authors stress the presence of emotional processing skills disturbance as a crucial factor for the disease. Here, we present a case of a 16-year-old male with no personal nor family history of psychiatric or neurological disorders, who developed an unexplained memory loss, during the lockdown consequent of the COVID-19 pandemic.

## Case Report

The patient was a 16-year-old, right-handed male, native Italian speaker; he attended the third year of a scientific high school with good profit, played the guitar, and played in a volleyball team; he was the second son of a couple of workers, socially integrated, and without a psychiatric history. One morning in March 2021, upon awakening, the patient manifested spatial-temporal disorientation; the boy reported to his parents that he could not remember the names and faces of close family members, friends, and classmates or his habits (e.g., he did not remember attending a guitar course). In the first few minutes, he showed great agitation, anguish, and concern, but he regained his composure after recovering his orientation toward the house and his family.

In the days before the onset, he presented with a mild headache and transitory tinnitus, and no particular personal event or significant changes in health status were reported. He was immediately transported to the hospital, where he underwent several diagnostic examinations. Objective neurological examination failed to reveal an anomaly; RMN was negative as was EEG; toxicologic tests were negative for alcohol, opioids, amphetamines, barbiturates, cannabinoids, cocaine, benzodiazepines, methadone, and ecstasy. Blood tests were normal as were the supra-aortic trunks' echo-Doppler (TSA), the cardiologic visit, and echocardiogram. A neuropsychiatrist, specialized in children/young adults, visited the patient, but no psychiatric diagnosis was made and the patient was discharged.

In the following days, he showed good anterograde memory and capacity to learn new information but continued to manifest retrograde memory impairment. Ten days after the onset, he underwent a vast neuropsychological assessment, including a clinical interview with the patient and parents, a set of cognitive tests, and some tests for psychodiagnosis.

Written informed consent was obtained from the parents of the patient for publication of this case report. The study was conducted following the principles of the Declaration of Helsinki.

## Neuropsychological Assessment

### *Parents and Patient Clinical Interview*

Parents reported the absence of a history of significant traumatic or stressful events in the last year. During middle school (5 years before), there was an episode of conflict with some schoolmates immediately resolved without apparent consequences. The boy was described as socially integrated and without signs of emotional suffering. The mother reported that the social withdrawal, due to the pandemic emergency, seemed to cause a significant psychological impact, both for the lack of opportunity to hang out with friends (who lived in other municipalities) and for the impossibility to relieve the built-up tension through sports (volleyball training had been suspended several weeks due to the pandemic). She also

reported that the time when the amnesic event occurred was very stressful for the young patient because of frequent written and oral school tests and that she believed this may have created excessive psychological pressure.

During the patient's interview, he reported that he was aware of the past memory impairment; he looked sad about it but not anguished by the problem. He showed to remember the pandemic's consequences and strongly deplored the current condition; he reported that his biggest problem (even more than the retrograde memory gap) was "*being locked down and not being able to get out.*" During the 10 days from the onset, thanks to the help of family and friends, he reported that he was reconstructing some memories but not always with direct retrieval of information; sometimes, he had "flashes" which however did not allow him to access a complete explicit memory.

#### *Neuropsychological Tests*

The patient did not show signs of anxiety or stress during the test session; Table 1 shows the results of the tests administered to the patient. A test for malingering was administered (although with normative data available from 18 years old), the SIMS questionnaire [12], that showed an overall normal score, suggesting the absence of simulating behavior, with only the subscale relating to memory disorders slightly beyond the cutoff (score = 4, cutoff = 2). To rule out a more generalized and non-memory-selective cognitive impairment, we administered the WAIS-IV scale [13, 14]. The boy obtained scores that were within the norm or in the range above the norm, demonstrating good capacities of both crystallized and fluid intelligence (IQ = 117). With the same goal, a set of tests for cognitive functioning in adolescents aged 16–18 years (Batteria di Valutazione Neuropsicologica) [15] was administered; ante-grade memory was fully preserved in its various components: short-term memory, working memory, and long-term memory.

Respect to retrograde memory, the Crovitz-Schiffman test was proposed [16]; the boy obtained a score of 33 (cutoff = 103.1). Most of the memories were recalled, concerning the last 10 days. Regarding more distant periods in time, the boy reported that he only has a few images/flashes but no clear memories.

#### *Psychological tests*

In order to rule out any personality disorders, we administered the MMPI for adolescents [17]; the results showed validity scales reliability; no attempts at exploitation, simulation, or dissimulation were present; high scores did not emerge in the clinical scales (hypochondria, depression, hysteria, psychopathological deviation, masculinity-femininity, paranoia, psychasthenia, schizophrenia, hypomania, social extraversion). There were no out-of-standard scores with respect to the presence of post-traumatic stress disorder, substance/alcohol use, and in the content scales (anxiety, obsessions, depression, health concern, alienation, bizarre ideation, cynicism, conduct problems, low self-esteem, low aspirations, family problems, school problems, treatment difficulties), except for the social discomfort score: A-sod = 66; there were also no signs of a pathological nature referable to a current disorder or to the structure of the personality, while the presence of vulnerability to frustration and a relationship style marked by acceptance and passivity with a low aggressive tendency, emerged as elements of fragility.

The administration of Dissociative Experience Scale (DES) [18, 19] showed a normal overall score that does not indicate the presence of notable phenomena attributable to a dissociative disorder, although between the subscales, the manifestations related to the presence of dissociative amnesia are noteworthy (pt tot = 22.5; cutoff = 30; pt amnesia = 48). A specific questionnaire for COVID-19-related distress was proposed [20], the Italian COVID-19 Peritraumatic Distress Index (CPDI), originally developed in China by Qiu et al. [21], with

**Table 1.** Results of the neuropsychological test administration

	Raw score	Weighted score	Description
<b>WAIS-IV</b>			
Verbal Comprehension Index	36	112	Above the norm
Similarities	24	11	Normal
Vocabulary	41	13	Above the norm
Information	15	12	Above the norm
Perceptual Reasoning Index	38	116	Above the norm
Block design	48	11	Normal
Matrix reasoning	24	15	Above the norm
Visual puzzle	18	12	Above the norm
Working memory index	25	114	Above the norm
Digit span	37	15	Above the norm
Arithmetic	13	10	Normal
Processing speed index	23	108	Above the norm
Symbol search	39	12	Above the norm
Coding	73	11	Normal
WAIS IQ	122	<b>117</b>	Above the norm
<b>BVN</b>			
Forward digit span	5	97	Normal
Backward digit span	5	108	Above the norm
Spatial span	6	105	Normal
Spatial memory imm	14.9	129	Above the norm
Late	1.6	108	Above the norm
Word memory imm	74	93	Normal
Late	12	111	Above the norm
Text memory imm	6.9	100	Normal
Late	8	117	Above the norm
Selective auditory attention	45	109	Above the norm
Selective visual attention	18	115	Above the norm
Verbal judgment	46	103	Normal
Raven PM 38 (A, B, C, D)	44	110	Above the norm
Phonemic fluency	33	89	Above the norm
Categorical fluency	63	93	Normal
Modified card sorting test	6	92	Normal

24 items whose content refers to anxiety, depression, specific phobias, cognitive change, avoidance and compulsive behavior, physical symptoms, and loss of social functioning in the past week. Items are rated on a 5-point scale ranging from 0 (“not at all”) to 4 (“extremely”), and the total score ranges from 0 to 100 (see the original article for test correction mode). The patient total score was 27/100 (0: the absence of suffering and distress – 100: extreme degree of distress); following original normative data, a score below 28 indicates no distress, between 28 and 51 mild to moderate distress, and above 51 severe distress.



### *Diagnosis According to DSM-V Criteria for Dissociative Amnesia*

Criterion a: satisfied, although concerning a global disorder, without the reference to a specific traumatic or stressful information; Criterion b: partially satisfied. The patient was aware of the disturbance, which caused moderate subjective distress. Nevertheless, the strong dissociation between the loss of memories referred to past, and the preserved capacity to acquire new information probably reduced the perceived and the actual functional impact. The patient was essentially able to learn, and this allowed him to quickly compensate for the disturbance. In regard to school learning, for example, the disturbance did not significantly affect the young patient's performances.

Criterion c/d: satisfied. Alcohol and drugs use were excluded as neurological and medical condition or factitious disorder. Due to the incomplete adherence to the DSM-V criteria, the disturbance was classified as "unexplained memory loss" [7].

## Discussion and Conclusions

We described the case of an adolescent suffering of sudden retrograde memory loss, without an organic cause detectable. Neuropsychological assessment confirmed severe retrograde memory impairment and normal cognitive functioning in all others domains. No personality disorder was found, and no known factors of distress emerged during the clinical interview with the patient and the parents, except for persistent complaints about the social isolation related to COVID-19 pandemic and the recent stress related to school tests. The patient, well adapted in a healthy familiar contest, never presented psychological difficulties before the onset of amnesia.

Interpretation of sudden unexplained amnesias probably refers to a complex interaction between predisposing psychosocial factors and distress, and a single explanation is not detectable. In our case report, we were able to exclude organic/substance and malingering-related factors with certainty. A simulation attempt was likewise excluded; no secondary benefits were found, and the specific test for detecting malingering was negative, except for a slight elevation of the subscale related to retrograde memory disorders, which was coherent with the subjective perception of the disorder.

With respect to other potentially influencing factors, the only factor that seems a "new" and critical factor for the onset of such a peculiar pattern is the reported strong complaints about the isolation connected to COVID-19 pandemic. In the last year, scientific production on the psychological and psychiatric impact of COVID-19 over adolescents has multiplied [22, 23]. Hundreds of papers have been published over the negative impact on the mental health of adolescents. Crucial factors seem to be home confinement and interruption of daily life, grief, and overuse of the Internet and social media [24, 25]. COVID-19 restrictions result in increased psychiatric disorders such as post-traumatic stress, depressive and anxiety disorders, as well as grief-related symptoms. Even so, to our knowledge, few cases are described with the manifestation of dissociation symptoms, and those few were in frontline healthcare providers [26]. In our patient, however, neither the specific scale for depression of MMPI-A nor the CPDI showed emotional distress index scores, and this does not seem to support the role of the COVID-19 pandemic lockdown as the trigger for these symptoms. On the other hand, the reliability of these results may be somewhat questionable since the patient had difficulty reconstructing a coherent image of himself previous to onset of symptoms and in particular, of his emotional response to pandemic. Indeed, while criticizing the very construct of dissociative amnesia, Merckelbach and Patihis [27] pointed out that several cases reporting dissociative symptoms did not report a traumatic history; but other authors [28, 29] argue that, at least in some cases, patients could not answer the trauma questions due to lack of self-certainty about their own histories that may

be due to dissociative processes themselves. Hence, in our opinion, a connection between the retrograde memory loss and the COVID-19 pandemic lockdown as suggested by parents and friends cannot be completely ruled out.

Finally, we cannot exclude others underlying factors that the boy may have hidden and not shared with the family, such as a teenage crush, disagreement with a friend, or difficulties to copy with scholar requests as a frailty that was not detected. Indeed, while Frewen et al. [30] have shown that the probability of moderate to severe dissociation defined according to the DSM-V is extremely low (2%) in the absence of any significant self-reported childhood trauma history, other authors [29] suggested that other kinds of traumatic events or other nontrauma antecedents “may show different conditional probabilities for the development of dissociative symptoms and disorders.” Merckelbach and Patihis [27] considered sleep problems [31], deficient affect regulation [32], and response bias [33] as possible alternative causes for dissociative symptom reports. However, none of these possible antecedents was reported in our case that hence remains diagnosed as a “sudden retrograde amnesia with uncertain etiology.”

### Statement of Ethics

The parents of the subject have given their written informed consent. Written informed consent was obtained from the parents of the patient for publication of this case report and any accompanying images. Ethical approval was not required for this study in accordance with local/national guidelines.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Funding Sources

The authors have no funding sources to declare.

### Author Contributions

Benedetta Basagni: drafting the article; Sonia Martelli: data collection; Anna Mazzucchi: critical revision of the article; Francesca Cecchi: critical revision of the article.

### Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

### References

- 1 American Psychiatric Association. [Diagnostic and statistical manual of mental disorders](#). 5th ed. Arlington, VA: American Psychiatric Publishing; 2013.
- 2 Kopelman MD. Disorders of memory. [Brain](#). 2002;125(Pt 10):2152–90.

- 3 Staniloiu A, Markowitsch HJ. Towards solving the riddle of forgetting in functional amnesia: recent advances and current opinions. *Front Psychol*. 2012;3:403.
- 4 Staniloiu A, Kordon A, Markowitsch HJ. Stress-and trauma-related blockade of episodic-autobiographical memory processing. *Neuropsychologia*. 2020;139:107364.
- 5 McNally RJ. Is traumatic amnesia nothing but psychiatric folklore? *Cogn Behav Ther*. 2004;33(2):97–11.
- 6 Pope HG, Poliakoff MB, Parker MP, Boynes M, Hudson JI. Is dissociative amnesia a culture-bound syndrome? Findings from a survey of historical literature. *Psychol Med*. 2007;37(2):225–33.
- 7 Mangiulli I, Otgaar H, Jelacic M, Merckelbach H. A critical review of case studies on dissociative amnesia. *Clin Psychol Sci*. 2021;10(2):191–211.
- 8 Mangiulli I, Jelacic M, Patihis L, Otgaar H. Believing in dissociative amnesia relates to claiming it: a survey of people's experiences and beliefs about dissociative amnesia. *Memory*. 2021;29(10):1362–74.
- 9 Patihis L, Pendergrast MH. Reports of recovered memories of abuse in therapy in a large age-representative US national sample: therapy type and decade comparisons. *Clin Psychol Sci*. 2019;7(1):3–21.
- 10 Lucchelli F, Spinnler H. The “psychogenic” versus “organic” conundrum of pure retrograde amnesia: is it still worth pursuing? *Cortex*. 2002;38(4):665–9.
- 11 Reinhold N, Markowitsch HJ. Emotion and consciousness in adolescent psychogenic amnesia. *J Neuropsychol*. 2007;1(1):53–64.
- 12 Smith GP, Burger GK. Detection of malingering: validation of the Structured Inventory of Malingered Symptomatology (SIMS). *J Am Acad Psychiatry Law*. 1997;25(2):183–9.
- 13 Wechsler D. *Wechsler adult intelligence scale*. 4th ed. San Antonio, TX: Pearson Assessment; 2008.
- 14 Orsini A, Pezzuti L. *WAIS-IV. Contributo alla taratura Italiana (70–90 anni)*. (WAIS-IV, contribution to the Italian standardization, ages 16–69). Firenze: Giunti OS; 2015.
- 15 Gugliotta M, Bisiacchi PS, Tressoldi P. *BVN 12–18: batteria di valutazione neuropsicologia per l'adolescenza*. Erickson; 2009.
- 16 Crovitz HF, Schiffman H. Frequency of episodic memories as a function of their age. *Bull Psychon Soc*. 1974; 4(5):517–8.
- 17 Archer RP, Krishnamurthy R. Minnesota multiphasic personality inventory–adolescent. *The corsini encyclopedia of psychology*. John Wiley & Sons; 2010. p. 1–2.
- 18 Bernstein EM, Putnam FW. Development, reliability, and validity of a dissociation scale. *J Nerv Ment Dis*. 1986; 174:727–35.
- 19 De Pasquale C, Sciacca F, Hichy Z. Validation of the Italian version of the dissociative experience scale for adolescents and young adults. *Ann Gen Psychiatry*. 2016;15(1):31–5.
- 20 Costantini A, Mazzotti E. Italian validation of CoViD-19 peritraumatic distress index and preliminary data in a sample of general population. *Riv Psichiatr*. 2020;55(3):145–51.
- 21 Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *Gen Psychiatr*. 2020;33(2): e100213.
- 22 de Figueiredo CS, Sandre PC, Portugal LCL, Mázala-de-Oliveira T, da Silva Chagas L, Raony Í, et al. COVID-19 pandemic impact on children and adolescents' mental health: biological, environmental, and social factors. *Prog Neuro-Psychopharmacology Biol Psychiatry*. 2021;106:110171.
- 23 Jones EAK, Mitra AK, Bhuiyan AR. Impact of COVID-19 on mental health in adolescents: a systematic review. *Int J Environ Res Public Health*. 2021;18(5):2470.
- 24 Bruining H, Bartels M, Polderman TJC, Popma A. COVID-19 and child and adolescent psychiatry: an unexpected blessing for part of our population? *Eur Child Adolesc Psychiatry*. 2021 Jul;30(7):1139–40.
- 25 Guessoum SB, Lachal J, Radjack R, Carretier E, Minassian S, Benoit L, et al. Adolescent psychiatric disorders during the COVID-19 pandemic and lockdown. *Psychiatry Res*. 2020;291:113264.
- 26 Azoulay E, Cariou A, Bruneel F, Demoule A, Kouatchet A, Reuter D, et al. Symptoms of anxiety, depression, and peritraumatic dissociation in critical care clinicians managing patients with COVID-19. A cross-sectional study. *Am J Respir Crit Care Med*. 2020;202(10):1388–98.
- 27 Merckelbach H, Patihis L. Why “trauma-related dissociation” is a misnomer in courts: a critical analysis of Brand et al. (2017a, b). *Psychol Inj L*. 2018;11(4):370–6.
- 28 Ross CA, Duffy CMM, Ellason JW. Prevalence, reliability and validity of dissociative disorders in an inpatient setting. *J Trauma Dissociation*. 2002;3(1):7–17.
- 29 Brand BL, Dalenbergh CJ, Frewen PA, Loewenstein RJ, Schielke HJ, Brams JS, et al. Trauma-related dissociation is no fantasy: addressing the errors of omission and commission in Merckelbach and Patihis (2018). *Psychol Inj L*. 2018;11(4):377–93.
- 30 Frewen PA, Brown MF, Steuwe C, Lanius RA. Latent profile analysis and principal axis factoring of the DSM-5 dissociative subtype. *Eur J Psychotraumatol*. 2015;6(1):26406.
- 31 Van der Kloet D, Merckelbach H, Giesbrecht T, Lynn SJ. Fragmented sleep, fragmented mind: the role of sleep in dissociative symptoms. *Perspect Psychol Sci*. 2012;7(2):159–75.
- 32 Briere J, Runtz M. Dissociation in individuals denying trauma exposure: findings from two samples. *J Nerv Ment Dis*. 2015;203(6):439–42.
- 33 Merckelbach H, Giesbrecht T, van Heugten-van der Kloet D, de Jong J, Meyer T, Rietman K. The overlap between dissociative symptoms and symptom over-reporting. *Eur J Psychiatr*. 2015;29(3):165–72.