

## WHAT DO WE OVER-LOOK DURING COVID-19 PANDEMIC? AN ADOLESCENT STROKE CASE PRESUMED CONVERSION DISORDER

Tugba Uyar Cankay<sup>1</sup> & Mert Besenek<sup>2</sup>

<sup>1</sup>Neurology Department, RTE University Education and Research Hospital, Rize, Turkey

<sup>2</sup>Child and Adolescent Psychiatry Department, RTE University Education and Research Hospital, Rize, Turkey

received: 20.5.2020;

revised: 2.6.2020;

accepted: 9.6.2020

\* \* \* \* \*

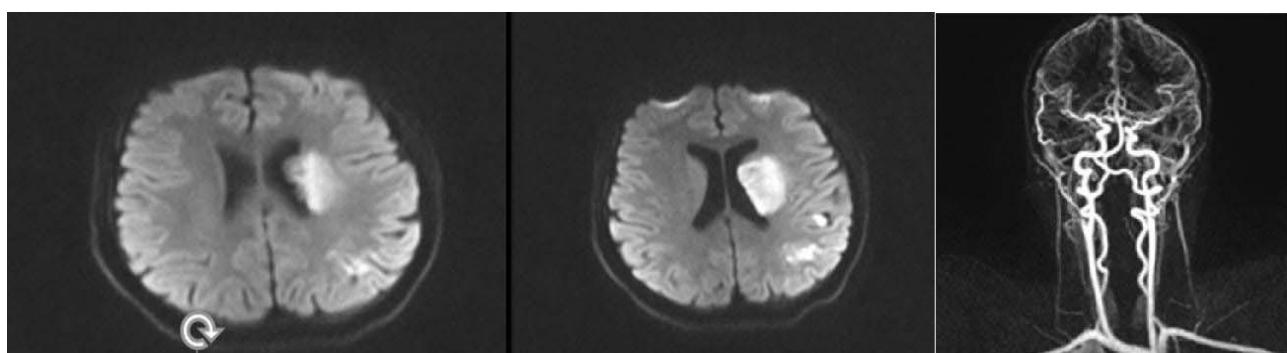
### INTRODUCTION

New Coronavirus which causes severe acute respiratory syndrome is still rapidly spreading all over the world and World Health Organization (WHO) declared that we are facing a pandemic (Sohrabi et al. 2020). Emergency departments, out-patient and in-patient units have been re-arranged to satisfy the medical needs during pandemic; and these patients became the priority for the clinicians regardless of their specialties. We aimed to present a striking case with devastating out-comes which we believe reflects the consequences of this paradigm shift in medical care.

### CASE REPORT

Female patient aged 18 with no history of medical or psychiatric diagnoses, was referred to emergency department with symptoms of agitation, aggression and numbness on left arm. She did not have any history of known diseases, smoking, substance use, familial migraine, stroke, heart disease or coagulation disorder; and she did not use any medications. She had Glasgow Coma Scale of 15 and she was cooperated and orientated. Motor, sensory, cranial and cerebellar neurological examinations were normal. Her psychiatric evaluation included agitation, aggressiveness, inappropriate and over-reactive affect with anxious ideations about her condition; so it was considered to be an emotional disturbance at first. After her cranial

brain tomography (BT) turned out normal, cranial magnetic resonance imaging (MRI) was planned. By that time patient was complaining about "the length of examinations" and how "she and her parents were exposed to Covid-19 in emergency department"; so they refused MRI and left. After five hours, she was re-referred with exacerbation of similar symptoms. Emergency physician considered this to be psychogenic due to patient being young, screaming, not having any neurological deficits and cranial BT being normal; so patient was administered diazepam 10 mg intravenously and discharged while sedated. She was brought back next morning because she did not wake up; and cranial MRI and MRI angiography revealed acute infarct areas in basal ganglia and periventricular white matter, so she was consulted to neurology department (Figure 1). Patient was started on aspirin and klopidogrel. No abnormalities were found in her rhythm Holter, echocardiography and trans-esophageal-echocardiography. Markers for hereditary thrombophilia were normal. Her thrombocyte count was 445.000/ $\mu$ L; and her peripheral blood smear showed reactive thrombocytosis secondary to iron deficiency anemia (IDA). Further anamnesis revealed that patient was told she might have IDA and advised to go pediatrics polyclinic in her previous emergency department referrals; but they did not seek treatment due to their fear of Covid-19 pandemic. She was on neurological assessment motor aphasic and hemiplegic on her right side at the discharge.



**Figure 1.** Diffusion weighted images with normal intracranial & extracranial MR angiography

## DISCUSSION

An unknown microbial pathogen was determined in patients with viral pneumonia in Wuhan, China towards the end of year 2019. It was later defined as a new form of coronavirus and temporarily named “2019 new Coronavirus (2019-nCov) which then turned into fast and wide spreading pneumonia outbreak (Lu et al. 2020). New coronavirus was airborne and also could be transmitted by direct contact. Furthermore, WHO declared it was a global pandemic and to prevent secondary infections people were advised to refrain from close connections (Sohrabi et al. 2020). Countries started to broadcast their actively infected, recovered and dead patient counts via social media and televisions in order to enhance people’s awareness and strengthen their containment strategies. This global strategy helped fighting off the pandemic; but also resulted in increased anxiety levels in the community. Our patient was referred during the Covid-19 pandemic and she was experiencing severe anxiety in addition to her neurological symptoms. While Covid-19 pandemic is causing tumultuous reactions all over the world, its indirect effect on neurology patients might result in insufficient medical care, because they are just too anxious or withdrawn about referring to hospitals for their symptoms.

Inadequate evaluation may alter the diagnosis of already complicated stroke cases. Stroke mimics (postictal seizure state or migraine) in child and adolescents are challenging for clinicians because they are more common than adults and diagnosis of acute arterial stroke is difficult (Shellhaas et al. 2006). Cerebrovascular diseases and stroke are becoming more important factors for morbidity and mortality in adolescents and already in top ten death causes (Zahuranec et al. 2005). Conversion, which should be in the differential diagnosis of strokes, is considered as psychiatric condition; in which wide range of neurological deficits may be present without patient simulating them and symptoms are thought to be not authentic (Glick et al. 2000). Behavioral changes in stroke present themselves as neurological deficits such as motor and speech deficits (Paradiso et al. 2013). In addition; abulia, apathy, akinesia, amnesia, disinhibition, hemi-neglect and affective disturbances can be seen in stroke patients (Huston et al. 1990, Leisman & Melillo 2013). Our case also had behavioral disturbances which contributed to the misdiagnosis on her first two referrals. Another important thing to point out in this case report is the inappropriate administration of benzodiazepine. Research done by Sidorchuk et al. shows that studies on pediatric benzodiazepine use predominantly focus on concerns about inappropriate prescriptions, “off-label” usage and prescriptions done by non-psychiatrists or primary care physicians (Sidorchuk et al. 2018).

## CONCLUSION

Same as most of the other diseases Covid-19 pandemic seems to be causing limitations for both patients and health care systems regarding prevention or access to effective treatment modalities in neurological diseases. Ineffective and inadequate medical interventions for stroke patients may result in catastrophic results. Detailed anamnesis and neurological examination are fundamental in order to distinguish between psychiatric and organic pathologies and determine the etiology and localization of organic pathology. All clinicians should be more cautious about management and treatment of patients with risk factors in this extraordinary time period especially in emergency departments. Algorithms regarding evaluations of patients with risk factors via telemedicine methods and treatment of essential conditions in out-patient clinical settings should be developed during Covid-19 pandemic. With this case report we aimed to point out diagnostic errors and misconceptions which might occur in emergency settings; and patients might refrain from seeking proper medical care during pandemic. While increasing people’s knowledge and awareness might enforce preventive behaviors and measures; it might also increase their avoidant and irrational beliefs. As clinicians, we need to develop future multidisciplinary algorithms for patient treatments and follow-ups in order to encourage them to act reasonably and lower their inappropriate reactions.

### Acknowledgements:

We would like to acknowledge the valuable contributions of Professor Cicek Hocaoglu in the creation of this case report.

### Conflict of interest:

None to declare.

### Contribution of individual authors:

Tugba Cankay consulted the case and devised the conceptual ideas of the case report.

Tugba Cankay & Mert Besenek searched the literature for relevant information.

Mert Besenek wrote the manuscript with support from Tugba Cankay.

Both authors contributed to the final version of the manuscript and provided critical feedback and helped shape the case report.

## References

1. Glick TH, Workman TP & Gausberg SV: Suspected conversion disorder: foreseeable risks and avoidable errors. *Acad Emerg Med* 2000; 7:1272-77
2. Huston JP, Steiner H, Weiler HT, Morgan S & Schwarting RK: The basal ganglia-orofacial system: studies on

- neurobehavioral plasticity and sensory-motor tuning.  
*Neurosci Biobehav Rev* 1990; 14:433-46
3. Leisman G & Melillo R: The basal ganglia: motor and cognitive relationships in a clinical neurobehavioral context. *Rev Neurosci* 2013; 24:9-25
  4. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H et al.: Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *Lancet* 2020; 395:565-74
  5. Paradiso S, Ostedgaard K, Vaidya J, Ponto LB & Robinson R: Emotional blunting following left basal ganglia stroke: the role of depression and fronto-limbic functional alterations. *Psychiatry Res* 2013; 211:148-59
  6. Shellhaas RA, Smith SE, O'Tool E, Licht DJ & Ichord RN: Mimics of childhood stroke: characteristics of a prospective cohort. *Pediatrics* 2006; 118:704-9
  7. Sidorchuk A, Isomura K, Molero Y, Hellner C, Lichtenstein P, Chang Z et al.: Benzodiazepine prescribing for children, adolescents, and young adults from 2006 through 2013: A total population register-linkage study. *PLoS Med* 2018; 15:e1002635
  8. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A et al.: World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *Int J Surg* 2020; 76:1-76
  9. Zahuranec DB, Brown DL, Lisabeth LD & Morgenstern LB: Is it time for a large, collaborative study of pediatric stroke? *Stroke* 2005; 36:1825-9

*Correspondence:*

Tugba Uyar Cankay, MD  
RTE University Education and Research Hospital, Neurology Department  
53 020, Rize, Turkey  
E-mail: tubaauyar@gmail.com