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## COVID-19: A Long-Term Tale of Mental Health Extortion

VIBHOR DUDHRAJ<sup>1</sup> , J. SWAMINATHAN<sup>2</sup>, RAJINI CHAWLA<sup>3</sup>, ARTI BAHL<sup>\*4</sup>

### To the Editor,

I read with interest the study by Shweta et al. on the Impact of COVID-19 and lockdown on the mental health of children and adolescents, which has brought to light a situation that is causing alarm among all.<sup>1,2</sup> I aim to share my views about the difficulties and challenges that children and parents encounter at the Department of PMR at Kalawati Saran Child Hospital, which is affiliated with Lady Hardinge Medical College in New Delhi. The psychological stress of being confined in homes and institutions may be worse than the virus's physical torment. School closures, a lack of outdoor activity, and irregular eating and sleeping habits are all likely to disrupt children's typical patterns, leading to monotony, discomfort, agitation, aggravation, and a range of neuropsychiatric symptoms. The Covid-19 outbreak had a significant impact on these children, making them more aggressive and less social. Despite the fact that most children have extra time to connect with their parents as a result of the lockdown<sup>3</sup>, but SARS-CoV2 is more likely to damage unattended children with intellectual impairments and problems, such as autistic spectrum disorder and attention deficit hyperactivity disorder.

In the statement, it is said that children's appropriate well-being is dependent not only on dietary and medical treatment, but also on good parental companionship, as the notion of nuclear families has posed a threat to their mental well-being in recent decades. A vicious cycle of psychological stress, forced home-stay due to a pandemic, and lifestyle changes will compound the detrimental effects on a child's overall health.<sup>4</sup>

Children confined during pandemics, according to Sprang and colleagues, may acquire a variety of symptoms linked with psychological stress and disorders, such as anxiety, acute stress disorder,

adjustment disorder, and post-traumatic stress symptoms.<sup>5</sup> Children with intellectual disabilities, as we all know, require particular care and attention from an early age. A child's physical and cognitive maturation occurs when he or she develops from 3 to 10 years old.<sup>6</sup>

To reduce the psychosocial effects of COVID-19 on children and adolescents, proactive and focused therapies may be given. Parents, doctors, psychologists, social workers, hospital managers, government officials, and non-governmental organisations all play important roles in the mission's success. Teaching children how to manage with anxiety and other mental health issues may help them grow into confident and resilient adults, making our society a better place for everyone. In order to recognise early indications of mental health concerns, caregivers and instructors must be educated about the possible mental health challenges of children and adolescents in the aftermath and during the COVID-19 pandemic.

We acknowledge the enormous sacrifice of our children and family that gives us the strength to continue our tireless effort to combat this pandemic.

The authors declare no conflicts of interest.

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#### AUTHOR AFFILIATIONS (\*: Corresponding Author):

1. BDS, MPH, Department of Public Health, School of Allied Health Sciences, Delhi Pharmaceutical Sciences and Research University (DPSRU), Govt. of NCT of Delhi, Pushp Vihar, New Delhi, Delhi-110017 (<https://orcid.org/0000-0001-9661-1030>)
2. Assistant Professor, Department of Public Health, School of Allied Health Sciences, Delhi Pharmaceutical Sciences and Research University (DPSRU), Govt. of NCT of Delhi, Pushp Vihar, New Delhi, Delhi-110017
3. Clinical Psychologist, Department of PMR, Lady Harding Medical College & Kalawati Saran Children's Hospital, Connaught Place, New Delhi, Delhi-110001
4. Joint Director, Div. of Epidemiology National Centre for Disease Control Directorate General of Health Services (DGHS), Ministry of Health & Family Welfare, Government of India, 22, Sham Nath Marg, Civil Lines, New Delhi, Delhi-110054

e-mail id for correspondence: [artichitkara\[at\]gmail\[dot\]com](mailto:artichitkara[at]gmail[dot]com)



## World Alzheimer's Day: The Need to Spread Awareness

Dr. HARPREET GREWAL

Alzheimer's Disease (AD) is a type of neurodegenerative disease of the brain, just as Coronary Artery Disease (CAD) is a disease related to the heart. Due to its progressive nature, its symptoms worsen with time. AD is thought to begin 20 years or more before symptoms arise.<sup>1,2</sup>

It initiates itself as changes in the brain that are unnoticeable to the person affected. It is only after years of such changes that individuals experience noticeable symptoms such as memory loss and/or language problems. These symptoms occur due to the fact that the nerve cells (neurons) of the brain that are associated with thinking, learning and memory (cognitive function) have been damaged or destroyed beyond repair.

Its progression affects neurons in other parts of the brain and eventually, neurons responsible for a person to carry out basic bodily functions, such as walking and swallowing are affected. Individuals become bed-bound and require around-the-clock care and its ultimately leads to demise of the patient.<sup>3</sup>

### ALZHEIMER'S DISEASE OR DEMENTIA?

It is common for people to wonder the difference between AD and dementia. The term "dementia" refers to an overall term for a particular group of symptoms and its characteristic symptoms include difficulties with memory, language, problem-solving and other thinking skills affecting a person's ability to perform routine day-to-day activities. In this context, AD is the most common cause of dementia. Infact, Alzheimer's dementia refers to dementia that is caused by, or believed to be caused due to the brain changes of a person suffering from Alzheimer's disease. Various studies have reported that episodic impairment of memory (amnesia) is prominently the earliest and most salient aspect of this AD dementia syndrome.

It has been estimated that by the year 2050, the number of people age 65 and older with AD in the USA alone is projected to reach 12.7 million.<sup>3</sup> In India, there were an estimated 3.7 million people suffering from dementia in 2010 and the grim situation is that it is projected to rise to approximately 7.6 million by the year 2030 with its awareness remaining low throughout the country.<sup>4</sup>

Even within the field of medicine, research in dementia and related diseases remain low. Most of our existing knowledge and estimates of the incidence of dementia come from small regional case studies.<sup>4</sup> There are, however, somewhat rare instances, particularly in younger patients (e.g., less than 65 years old), where AD initially presents with dementia dominated by higher-order visual dysfunction, executive dysfunction or deficits in language. The nature of AD is such that it may the prime cause of even more deaths than recognized and reported by official sources and the main reason for this is either its being considered as an "age" related change or inability to afford its treatment. AD is also a primal cause leading to disability as well as poor health among older adults as a person lives through years of morbidity as the disease progresses and till the time the patient dies.<sup>3</sup>

To raise awareness regarding this important disease, September 21<sup>st</sup> every year is World Alzheimer's Day around the world. This is an international campaign aimed at raising awareness and challenge the common stigma that surrounds Alzheimer related dementia.

September 2021 marks the 10<sup>th</sup> world Alzheimer's month since the campaign was launched in 2012. From previous studies, an average of 2 out of 3 people globally have little or no understanding of Alzheimer's disease and associated dementia in their



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## AUTHOR AFFILIATIONS:

Professor & Head (Unit-II), Department of Dentistry, UCMS & GTB Hospital, Delhi-110095

e-mail id for correspondence: hrprtgrwl[at]gmail[dot]com





# Environmental and Health Impacts of Electronic Waste: A Global Concern!!

ANUJA PRABHAKAR<sup>1</sup>, ROMI NAYYAR<sup>\*2</sup>, PK SHARMA<sup>3</sup>

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Electronic waste, commonly referred to as e-waste, is waste generated from discarded waste from an alarming number of electronic components which contains toxic substances affecting human health and the environment across the globe. In India, it is of extreme significance as its huge production uses more electronic materials and thus, dumps a significant amount of e-waste simultaneously. India is still lacking suitable infrastructure and methods is proper recycling and disposal. This review is an overview of current scenario in the developing countries like India depicting the magnitude of environmental and health hazards associated with improper recycling and disposal methods.

KEYWORDS: Health, Cadmium, Immune System

## INTRODUCTION

Rapid urbanization and increased demand are two main factors propelling the electronic and electrical equipment manufacturing industry as a dominant producer across the globe.<sup>1</sup> In India, the Information and Technology (I&T) sector has been a significant contributor to the growing economy.<sup>2</sup> With the world undergoing a digital revolution, electronic gadgets and equipments have invaded every single human life, providing them more comfort, security with acquisition and exchange of information.<sup>3</sup> Such expansion comes with a caveat though: this technology addicted generation is creating its own toxic footprints in the form of e-waste.

## E-WASTE: SOURCES AND CATEGORIES

E-waste is described as “any electronic appliances which are termed as old, end of life devices such as laptops and computers, television sets, mobile phones/smart phones, DVD players etc. which are discarded by their users due to any malfunction or after nearing the end of their life cycle”.<sup>4</sup>

A few of the e-waste sources are laptops, router devices, scanners, printers, televisions, mobile phones, fridge, washing machines, microwaves, gaming consoles, tubelights, bulbs, LED lights, remote controls, toys, speakers, ECG machine, ultrasound machines, x-ray, card swiping machine etc.

Generation of e-waste is divided among categories which include: (i) Household appliances large in size, (refrigerators, washing machines, etc), (ii) communication and information technology

(smartphones/laptop, etc) and (iii) consumer equipment (television sets, etc).

## E-WASTE AND ITS COMPOSITION

The discarded e-waste has many components categorized into identifiable and/or removable. A few examples include metal, compressor / motor, glass, displays, rubber, concrete, wiring, circuit board, textile, fluorescent lamp(s), heating element, incandescent lamp and so on. This e-waste can be further elaborated as hazardous and non -hazardous. Examples of generated hazardous waste includes elements like mercury, lead, arsenic, hexavalent chromium, selenium and cadmium.<sup>5</sup>

## E-WASTE AND ITS GENERATION

The following are the main reasons on the generation of e-waste:

- Research and advancement in technology
- Lifestyle changes
- Limited usage

The absence of strict policies in India put a hurdle in the management of E-waste. The unofficial sector uses primitive methods of waste disposal and recycling which includes overtly blazing the waste followed by exposing them to acid for retrieving precious metals and then throw the undesired waste into landfills. Due to the lack of any protective equipment, labourer in the unstructured e-waste management make themselves prone to high risk and unsafe consequences.

As a result of such practices, hazardous metals present



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in the e-waste get accumulated into the soil and water or convert into toxic emissions that are released into the air with disastrous health outcomes on human and environmental health.

### E- WASTE AND ITS HAZARDS

General health and environment are very prone because of improper management of e-waste. Toxins produced such as furans and dioxins from PVC, mercury, beryllium, cadmium, lead, etc are passed into the environment and cause the following risk to health:

- Issues related to reproduction & development
- Impairment of immune system and nervous system
- Hormonal changes
- Kidney damage
- Cancer of the lung
- Beryllium disease (Chronic)
- Skin ailments
- Cadmium accumulation in liver and kidney (including kidney damage)
- Asthmatic bronchitis
- Damage to DNA
- Weakness in muscles

### E-WASTE & ITS IMPACT ON GENERAL HEALTH AND ENVIRONMENT

E-waste is an amalgamation of multiple components which contain harmful substances which lead to deleterious effect on health and the environment. These problems arise due to the improper management of these hazardous components.<sup>6</sup> It can have serious implications for the surroundings where e-waste is disposed or recycled. Electronics contains highly noxious chemicals like mercury, cadmium, lead, beryllium and phosphor compounds.<sup>3</sup>

### VARIOUS HARMFUL PRODUCTS OF E-WASTE

**Lead:** Its adverse effects are mainly seen in the central nervous system, hemopoietic system, reproductive system, genitourinary system and peripheral nervous system and impair one's standard of living.<sup>7</sup>

**Mercury:** Its common undesirable health impact includes damage in the genito-urinary system, Central Nervous system, peripheral nervous system with the ability to affect the developing foetus. The inorganic mercury dispersed in water changes into methylated mercury which is taken up fishes which is then consumed by humans and affects overall health.<sup>5,7,8</sup>

**Cadmium:** Cadmium is a long-term snowballing poison and congregates in kidneys. Cadmium along with beryllium has been found to have carcinogenic potential.<sup>9,10</sup>

**PAH (Polycyclic Aromatic Hydrocarbons):** This chemical compound exerts a deleterious effect on our urinary bladder, skin and lungs. The link between skin and lung cancers has been established in various studies.<sup>9,10</sup>

### GLOBAL SCENARIO

Rapid Advancement in the field of research and technology in the 18<sup>th</sup> century brought about the industrial revolution which pronounced a new era in human society. In the 20<sup>th</sup> century, evolving technological methods have enhanced the quality of human life, however, on the flip side, has led to an array of problems both for the environment and one's health. Globally around huge tons of e-waste in the range of approximately 50 million tonnes are produced annually. The leading e-waste generator is USA, which discards 3 million tonnes every year followed by China with disposal of 2.3 million tons of e-waste.<sup>9</sup>

### E-WASTE AND THE INDIAN SCENARIO

India was reported to be the 2nd largest producer of E-waste in Asia and generates approximately 3,30,000 tonnes of E-waste in a year.<sup>11</sup> The collection and recycling of such wastes in the country is taken care of by the informal sector at present, due to which, the government of India took an initiative enhancing awareness about safe management of electronic waste. Regulation of e-waste comes under the ambit of the Ministry of Environment, Forests, and Climate Change (MoEFCC). In addition, the Central Pollution Control Board (CPCB), and the State Pollution Control Board (SPCB) is implementing procedures set forth by the MoEFCC for safe e-waste disposal. Other Organizations in India include, but are not limited to: Knowledge bank for e-waste management in India, The E-waste Guide, India ([www.ewaste.in](http://www.ewaste.in)), National Solid Waste Association of India (NSWAI) ([www.nswai.com](http://www.nswai.com)), Toxics Link ([www.toxicslink.org](http://www.toxicslink.org)) and tEP Workweb, WEEE Forum, Clean India, Indian Environmental Society, INDIA and Microbial Biotechnology Area of Tata Energy Research Institute.<sup>12</sup>

### DRIVERS AND CHALLENGES<sup>5</sup>

The challenges faced in the management of e-waste by

the society can be seen mainly as to reduce the burden of e-waste, reduce exposure to workers and community, improve the collection system as well as the legal frame work and to prevent the leaching of heavy metals from land fills and incinerators.

In the absence of reliable data present for assessing the volume of e-waste generated in the country, manufacturing companies and users are even not aware of correct e-waste disposal/hazards and there is no available estimation of the e-waste being recycled and generated in India.

E-waste is mostly processed by the informal sector using elementary techniques like open-air burning, acid leaching causing damage to the environment and little or no knowledge of toxins within the workers makes them exposed to health hazards. In addition, open backyard recycling impacts nearby residents and immigrant labourers.

Inefficient recycling procedures lead to loss of substantial material(s) as recyclers who recover precious metals (gold, platinum, silver, copper, etc) improperly dispose of the rest in the absence of any specific law for the management of e-waste.

## E-WASTE TREATMENT AND DISPOSAL METHODS<sup>14</sup>

**1. Incineration:** It is complete combustion of waste material at high temperature (900-1000°C). Its major advantage is that it reduces the e-waste volume, there is a maximum utilization of inflammable substances and dangerous organic matters are converted into less toxic products. On the other hand, its disadvantages include release of a large amount of residual gas and significant emission of cadmium and mercury.

**2. Recycling:** Recycling of various e-waste can be done after dis-assembly of different components and removal of toxic and non-working components.

**3. Re-Use:** Re-use of working equipment/ components shall help in reducing the global e-waste load.

**4. Landfilling:** It is a widely used method of e-waste disposal. Landfilling trenches uses the technique of burying e-waste by a thick layer of soil. In new-age techniques, an impervious layer of clay or plastic and the extracts are collected and carried to wastewater treatment plant. However, it is not considered as a safe method as it leads to leaching of toxic materials

underground and causes water and soil contamination.<sup>15-17</sup>

## CONCLUSION

E-waste should be reused, recycled and disposed in a safe and a standardized manner. When not refurbished, it should be disassembled by well compensated, trained and protected workers with advanced e-waste recycling facilities and technologies. An acceptable risk threshold should be marked different for children and adults and efficiently eliminating the presence of toxic components completely is important. At last there should be policies to be implemented with research needs, education and awareness programs in countries like India.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. Ph.D. (Environmental Studies), Independent Research Scholar, Vizag, India
2. GNM, Consultant Nursing Staff, Nuh, Haryana, India
3. M.Sc. Statistics & Former Professor (Retired), Baddi, Himachal Pradesh, India

**Contact Corresponding Author At:** editor[dot]ihrj[at]gmail[dot]com



# Muscular Adverse Events Associated with Statins

REENA ROYAL<sup>1</sup>, NUWAN JAYAWARNDENE\*<sup>2</sup>

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Statins are an important group of lipid lowering medications that have helped to control cardiovascular mortality globally. Muscular side effects, mostly myalgia, is a known adverse event of statins. Intense physical activity, kidney or liver failure, hypothyroidism, inherited or metabolic myopathies, and some medications, are risk factors for statin-induced myalgia. Muscular adverse events are more often observed with higher doses or with the use of lipophilic statins. Much is not known about the precise mechanisms responsible for the statin related muscular adverse effects, a few hypothesis have been suggested. It is important to measure plasma creatine phosphokinase in subjects who encounter myalgia while being treated with statins. In this review we present some general safety information on muscular adverse events caused due to statins.

**KEYWORDS:** Statins, Myalgia, Side Effects

## INTRODUCTION

Statins help to maintain the cholesterol level and decrease cardiovascular complications.<sup>1</sup> They are therefore a widely prescribed therapeutic class. However, several studies indicate that approximately 50% of patients discontinue statin therapy within the first year of prescription.<sup>2,3</sup> There are many reasons for poor adherence to treatment, but the over-occurrence of muscular effects is an important cause. Thus, myalgia on statins is a veritable clinical challenge. In this article, we propose to analyze the different forms of muscle complications under statins, their frequency, the difficulty of their diagnosis, the factors favoring their occurrence, the influence of the dose and the molecule prescribed, the mechanisms involved in statin muscle toxicity, and their management, in clinical practice. Myopathy is used broadly to describe any statin-related muscle side effect. Myalgia describes any muscle pain, without creatine phosphokinase (CPK) elevation.

The term "Myositis" is used for muscle manifestations with increased CPK. Rhabdomyolysis defines a serious complication including muscle pain, significant elevation of CPK (>10 times the upper limit of normal), increased creatinine, and usually dark urine with myoglobinuria. Besides the classic form of statin-induced rhabdomyolysis, a very rare form of statin-induced autoimmune rhabdomyolysis has been described.<sup>4</sup> This rare form, characterized by the presence of anti-HMG-CoA autoantibodies, requires

treatment with glucocorticoids, immunosuppressants, and immunoglobulins.<sup>4</sup> The muscle effects of statins represent a continuum from normal CPK muscle soreness to rare cases of rhabdomyolysis. They usually appear a few weeks after initiation of therapy, but can sometimes be seen several years after initiation of statin therapy.

The frequency of muscle complications on statins is difficult to define precisely. In controlled clinical studies, the frequency of muscle side effects is estimated to be between 1.5% and 5.0%.<sup>5</sup> Often, the frequency of muscular side effects does not appear significantly higher in patients on statins than in those on placebo. The rather low frequency of muscle side effects in "controlled" intervention studies may be explained by several reasons: the non-inclusion of mild to moderate muscle pain in the studies, the exclusion of any subject with a history of myopathy on statins or who had muscle pain during the run-in phase, and the biased psychological profile of patients agreeing to participate in clinical studies.<sup>6</sup> Thus, observational studies and daily clinical data show a higher frequency of muscle side effects on statins. In 4% of the patients in the study, there was disabling pain for daily physical activity, and in 0.4%, severe pain requiring cessation of any activity including professional.<sup>7</sup> The US Understanding Statin Use in America and Gaps in Education study found a 25% prevalence of muscle side effects in subjects receiving statin therapy.<sup>8</sup> However,



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the link between reported muscle pain and statin liability is not always clear. Many environmental or cultural factors could also be involved in patients' blaming statin therapy for the occurrence of muscle disorders. For example, in an international survey, the occurrence of unbearable muscle pain on statins was reported in an average of 6% of patients, with significant differences between countries, ranging from 2% for Italy, Spain, Japan and Sweden, to a rate between 10% and 12% for Canada, the UK and the USA.<sup>9</sup> It is highly likely that the frequency of muscle effects of statins is overestimated by patients.<sup>10</sup> These data confirm that not all muscle pain experienced by patients is necessarily related to statins. Thus, while the prevalence of muscle effects on statins is likely to be underestimated by interventional studies, it is clearly overestimated in observational studies and routine clinical practice where any muscle symptomatology presented is not necessarily secondary to statin treatment. However, evidence for a direct effect of statins is provided by a double-blind controlled study objectifying a largely reversible mitochondrial myopathy in patients with normal CPK myalgias on statin.<sup>11</sup>

Diagnosis of statin liability in the face of muscle symptomatology is not obvious, particularly in the absence of CPK elevation. Risk factors for the occurrence of muscle complications on statins include advancing age, female gender, low body mass index, genetic makeup, intense physical activity, kidney or liver failure, hypothyroidism, inherited or metabolic myopathies and excessive alcohol. A few drugs namely fibrates, nicotinic acid, ciclosporin, digoxin, antifungals, macrolides, erythromycin, clarithromycin, protease inhibitors, verapamil, diltiazem and amiodarone are also known risk factors to the occurrence of muscle complications. A genetic polymorphism affecting the OATBP<sub>1</sub> transporter, responsible for the uptake of statins by the liver, has been authenticated as a factor increasing the risk of statin myopathy.<sup>12</sup>

Several data strongly suggest that the occurrence of muscle effects is influenced by statin dose. Muscle biopsies from patients with muscle effects secondary to statin use have shown muscle cell necrosis with mitochondrial functional abnormalities.<sup>13</sup> The pathophysiological mechanisms responsible for the muscular effects of statins are not fully elucidated, but several hypotheses have been put forward: Depletion of ubiquinone is a suggested one. The latter is involved in the transport of electrons in the mitochondria and

its reduction is likely to impair mitochondrial function. The exact role of ubiquinone, or coenzyme Q<sub>10</sub>, depletion in the occurrence of statin muscle effects is still debated. Indeed, a study performed after 6 months of treatment with simvastatin 20 mg/d did not demonstrate a decrease in ubiquinone concentration at the muscle level.<sup>14</sup> Another randomized study objectified an efficacy of coenzyme Q<sub>10</sub> supplementation in reducing muscle pain on statins.<sup>15</sup> Depletion of isoprenoids is other popular mechanism. It has also been suggested that the reduction of cholesterol content within myocyte membranes may modify the fluidity of the cell membrane, and thus the proper function of ion transporters. This dysfunction of the myocyte membrane could cause cramping and myalgia. This hypothesis remains to be confirmed. Modification of the calcium balance in the muscle cell is another proposed mechanism. Statins inhibit mitochondrial respiratory chain complex with consequent depolarization of the inner membrane promoting calcium efflux from the mitochondria to the cytoplasm.<sup>16</sup>

Excess cytoplasmic calcium is recaptured by the sarcoplasmic reticulum. However, excess calcium within the sarcoplasmic reticulum is released into the cytoplasm via the ryanodine receptor. It has been suggested that statins may also directly activate the ryanodine receptor thereby enhancing excess calcium in the cytoplasm.<sup>16</sup> Calcium overload in the cytoplasm promotes cramping, myalgia and muscle cell apoptosis. Management of myalgia due statins starts with assessment of the intensity and tolerance of the pain, and its nature, whether permanent or transient, as well as possible triggering circumstances, such as unusual physical activity or sports. Concomitant medications that add as a risk factor to myalgia should be considered. If the CPK exceeds 10 times the upper limit of normal, it is imperative to stop the statin and perform urgently a plasma creatinine assay and a myoglobinuria search. Close clinical and biological monitoring should be implemented. In case of frank rhabdomyolysis, vascular filling should be started, without delay. If the CPK level is normal or increased, but less than 10 times the upper limit of normal, the dose of statins should be reduced, or treatment should be withheld altogether. If CPK values exceed 5 times the upper limit of normal or significant muscle pain, transient discontinuation of treatment is strongly advised. If CPK levels are increased, CPK checks should be performed every 1-2 weeks. If muscle pain persists after stopping statin therapy, it is necessary to look for another cause of muscle damage and to perform an

electromyogram. Alternatively, alternating treatments may be suggested like long half-life statins. Before declaring a patient completely statin intolerant, it seems important to try several alternatives with statins and not to abandon statin therapy too quickly. In case of frank intolerance to statins after several attempts, another treatment strategies should be tried.

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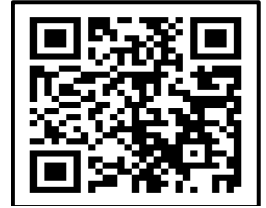
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### AUTHOR AFFILIATIONS: (\*Corresponding Author)

1. MD (Internal Medicine), Practicing Medical Specialist, Lumbini, Nepal.
2. B.Sc. Nursing, Mankulam, Sri Lanka.

**Contact Corresponding Author at:** editor[dot]ihrj[at]gmail[dot]com



# Serotonin Syndrome Associated with Antidepressant Discontinuation in a Neonate Following Drug Exposure During Pregnancy

DOLMA GURUNG<sup>1</sup>, SUNIL BORAH<sup>2</sup>, SAMEER WANGU<sup>\*3</sup>

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Sudden withdrawal of some drugs leads to withdrawal issues. We describe a baby girl who was indirectly exposed to venlafaxine as her mother was administered this drug during pregnancy for treatment of depression. The subject presented with involuntary movement of the limbs. The mother had also encountered similar scenario along with some other symptoms after she suddenly discontinued her medication. The symptoms of the mother completely resolved a few hours after she took another dose of venlafaxine. The baby was kept under observation and recovered completely without any intervention. We suggest that healthcare professionals should be aware that patients may require tapering of anti-depressants before discontinuation.

**KEYWORDS:** Serotonin Syndrome, Withdrawal Symptoms, Antidepressant

## INTRODUCTION

Abrupt discontinuation of many pharmaceuticals is associated with withdrawal symptoms. Antidepressant drugs are associated with a group of common symptoms after discontinuation.<sup>1</sup> The first cases of antidepressant discontinuation syndrome were reported for imipramine by Andersen and Christiansen in 1959. Since then, this phenomenon has been described for different families of antidepressants: Tricyclics, Monoamine Oxidase Inhibitors, and more recently, selective serotonin reuptake inhibitors. Some newborns exposed during pregnancy to serotonin and norepinephrine reuptake inhibitors or selective serotonin reuptake inhibitors may present, at birth, symptoms such as respiratory distress, cyanosis, apnea, seizures, feeding difficulties, vomiting, hypoglycemia, muscle tone changes, tremors, or irritability. This is related to the direct toxic effect of selective serotonin reuptake inhibitors and serotonin and norepinephrine reuptake inhibitors and is known as antidepressant discontinuation syndrome or serotonin syndrome. There are very few documented and published cases in the literature on newborns exposed during pregnancy to selective serotonin reuptake inhibitors with subsequent development of serotonin syndrome.

## CASE REPORT

We present the case of a 5-day old female baby who was referred from a rural civil hospital to our clinic for presenting involuntary movements of the four limbs from 2 days, lasting less than a minute. Birth weight of

the baby was 3.5 kilograms. As per the medical history, only the mother had been taking venlafaxine treatment during pregnancy. There were no other perinatal incidents. Upon arrival at our centre, she was monitored with normal vital signs, and brain function monitoring was started by means of amplitude-integrated electroencephalography, showing a continuous trace. Subsequently, a conventional electroencephalogram was performed, coinciding with frequent movements of the patient, which was reported as normal, without pathological graph elements of epileptiform morphology. Brain ultrasound showed no relevant alterations.

Toxicity determination was performed in urine, with negative result. Infectious, neurometabolic, and hormonal examinations were performed, without evidence of any pathological findings. The patient had normal results at physical and neurological examination at all times. The mother had also encountered dizziness, lightheadedness, excessive sweating, irritability, dysphoria, and insomnia and started performing similar movements few days after stopping the treatment with venlafaxine that she had received during pregnancy, so it was suspected that the condition was due to a serotonin syndrome caused by venlafaxine withdrawal. The mother also revealed that she fully recovered from her withdrawal symptoms few hours after she was given a dose of venlafaxine by her family physician and now, she continues with her



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prescription. The baby was kept under observation in our special care unit and no intervention was started. Her involuntary movements persisted intermittently, becoming less and less frequent, giving way completely after one week of life. The patient was discharged without incident and remained asymptomatic at weekly and monthly follow up.

## DISCUSSION

The phenomena of discontinuation of serotonin reuptake inhibitors have been described since first half of 20th century, their appearance being unusual in the neonatal setting. It is well recognized that babies exposed to antidepressants in utero may develop symptoms of drug withdrawal following birth. Such symptoms include diarrhea, vomiting, hypothermia, restlessness, irritability, agitation, inadequate feeding, insomnia, hypoglycemia, respiratory distress, altered muscle tone, hyper-reflexia, tremors and seizures.

A urine toxicology screen when taken shortly after birth in symptomatic subjects can be used to exclude exposure to certain drugs. Venlafaxine, with noradrenergic and serotonergic action, is a relatively new antidepressant. However, in a clinical trial, Farah and Lauer described discontinuation episodes in some patients.<sup>2</sup> Fava et al. found discontinuation symptoms in 78% of patients treated with sustained-release venlafaxine versus 28% in patients treated with placebo.<sup>3</sup> The diagnosis was made after the exclusion of other causes of paroxysmal movements and confirmed when the same symptoms were observed in the mother after the drug was discontinued. Current evidence indicates that fetal exposure to selective serotonin reuptake inhibitors during the last trimester of pregnancy may lead to a neonatal behavioral syndrome, generally self-limiting.<sup>4</sup> The decision to

expose the fetus to antidepressant medications during pregnancy must be weighed against the risks of untreated maternal depression for both the mother and the fetus, so it should be used only if the potential benefits justify the risks to the fetus. Exposed newborns should be monitored after delivery for the direct toxic effects of this drug, drug discontinuation syndrome, and serotonin syndrome.

## CONCLUSION

Discontinuation related adverse reactions are fairly common among antidepressant treated patients. This may also affect the baby in a similar way if these drugs are administered to the mother during pregnancy and abruptly stopped. Healthcare professionals should consider tapering the antidepressant dose gradually.

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### AUTHOR AFFILIATIONS: (\*Corresponding Author)

1. MD (Obstetrics & Gynaecology), Senior Consultant, Sikkim, India
2. MD (Paediatrics), Associate Consultant, Bhatinda, Punjab, India
3. MD (Paediatrics), Associate Consultant, Indore, India

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Contact Corresponding Author at: editor[dot]ihrj[at]gmail[dot]com



# A Qualitative Analysis of Healthcare Students' Perceptions Towards Online Learning due to the COVID-19 Pandemic

KESARI SINGH<sup>\*1</sup> , NISHA SINGH<sup>2</sup>

**INTRODUCTION:** While online learning has the ability to bring students and teachers together in the Distance Education (DE) mode, it is not feasible in the healthcare based professions.

**AIM:** To analyze healthcare students' perceptions towards online learning due to the COVID-19 pandemic.

**MATERIALS AND METHOD:** This qualitative, focus group-based study was done on the three focus groups consisting of 15 students each: medical, dental and allied sciences. Data were collected using observations from the recordings of the scheduled online interview which was approximately 30-minutes in length and the investigator asked questions from the pre-validated interview guide consisting of seven questions. Data was analyzed using the constant comparative method, which was then consequently categorized into two major areas: positive experiences and negative experiences. Positive experiences included: time flexibility, convenience, ease of connection and ease of learning; while negative experiences included instructor's inexperience and a lack of interaction, self-motivation, isolation and missing out on practical learning.

**RESULTS:** While responses of the positive experience ranged from "I have the flexibility to wake up few minutes before the lecture and directly log on for the lecture" to "Even during the closure of schools/ classes, I need not worry about lagging behind in my studies"; the negative experiences included statements like "the inexperience of the instructor in handling the teaching software led to difficulties and interruption in learning" and "I am a great loss due to missing patient work!! How am I going to become a good doctor if I don't practise on patients under supervision of my staff".

**CONCLUSION:** While students are slowly adapting themselves to online based learning, those belonging to the healthcare sector are missing out on their practical classes which has the potential to hamper the quality of care being provided by them as future professionals.

**KEYWORDS:** COVID-19, Learning, Healthcare

## INTRODUCTION

Online learning, is a boon for people to learn a new set of skills or get an education, especially in the field of distance education, which has become increasingly common in many universities worldwide as it brings the teachers and students closer.<sup>1</sup> However, its importance in courses related to the healthcare sector is limited as these courses depend on practical based patient teaching and learning and not offered via DE mode.

However, as the world started to battle the onset of the dreaded COVID-19 pandemic, social distancing became the norm, and led to undesirable effects on practical, patient-based learning opportunities at the institutional level. With countries enforcing lockdowns as an urgent need to protect and save communities, societies, and the nation as a whole, educational institutions began to struggle and contemplate on various options to deal with such an unprecedented situation.<sup>2</sup>

The only feasible option to continue with education in such challenging times seemed to immediately adopt the online learning mode. However, while this seemed like a mundane task, researchers have previously

proven that a significant challenge for university teachers has been their lack of the pedagogical content knowledge needed for teaching students via the online medium.<sup>3</sup>

Apart from teachers, researchers have reported that students were reluctant to take online courses and at times, complained about the online classes they undertook during pre-covid times.<sup>4</sup> Therefore, the present qualitative study was undertaken to analyze healthcare students' perceptions towards online learning due to the COVID-19 pandemic.

## RESEARCH QUESTIONS

1. What are the student experiences during online learning and would they like to continue with the same?
2. What factors lead the students to pay/not pay attention in their online classes?
3. What are student's reactions on missing their patient-based practical learning?

## MATERIALS AND METHOD

This qualitative, focus group-based study was done on three focus groups consisting of 15 students



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each: medical, dental and allied sciences. Students were enrolled over a period of three months via a combination of convenience and volunteer sampling. Students who joined their course after 2019 were excluded from the study as they had little or no practical exposure to pre-clinical/clinical/patient work.

Participation in the study was voluntary and before taking their written consent, students were distributed an online document stating the aim and objectives of the present study as well as their role as participants. Students were assured of the confidentiality of their data and access to the recordings were only available to the primary investigator. For data analysis, other investigators were only shared an audio recording of the meeting to conceal participant identity.

Data were collected using observations from the recordings of the scheduled online interview. This allowed researchers to validate as well as crosscheck the reported data.<sup>5</sup> The duration of the interview was approximately 30-minutes in length and the investigator asked questions from the pre-validated interview guide consisting of seven questions. To eliminate interviewer's bias, the questions were framed in a non-authoritative and non-implied nature; they were open ended in which the perceptions and experiences of the students were duly recorded without interference of any kind. Data was analyzed to answer the research questions and to cross reference similarities and differences among participants.

Extensive coding of the interview was done by the researchers using the constant comparative method.<sup>6</sup> Data were organized around each research question, which related to experiences of students taking online classes and the factors shaping those experiences and this information was then consequently categorized into two major areas: positive experiences and negative experiences of online education. The positive experiences included: time flexibility, convenience, ease of connection and ease of learning; while negative experiences included instructor's inexperience and a lack of interaction, self-motivation, isolation and missing out on practical learning.

## RESULTS AND DISCUSSION

Here, the individual positive and negative responses of the students are discussed.

### POSITIVE RESPONSES

**1. Time Flexibility:** Time flexibility of the students was found to be the greatest aspect of online learning. Responses ranged from "I have the flexibility to wake up few minutes before the lecture and directly log on for the lecture", "There is no worry of time being a constraint while completing assignments", "Even if I miss a class, online recording provides an easy access for me to go back and learn what I missed", "Due to any important work at home, the online recordings of lecture shared help me catch up on what I missed".

The students reported the time flexibility as a positive aspect as they reported that they has the "least distraction from the instructor as well as colleagues during the lectures and could focus solely on the topic being taught". Management of time was found to be significantly correlated with the cumulative grade point average of students as reported by Adams RV et al.<sup>7</sup>

**2. Convenience:** Convenience was another positive aspect reported by the participants as it was reported by students that "The convenience of logging in from home saves time of getting ready for college and saves travelling time", "It is more convenient for me to understand concepts away from all distractions occurring in the lecture theatre" and "Online learning is more convenient as it saves me from the hassle of carrying books around the college and then run to the library/ locker room every time I forget my book(s)/material(s)". However, on the contrary, convenience has been found to be an enormous non-quality factor among students<sup>8</sup> and has driven up online demand around the globe.<sup>9</sup>

**3. Ease of connection:** Responses from students included "I can connect with my teachers and class in an instant" to "Receiving Assignments and their submission is an easy task" as well as "My fast internet makes it easier for me to understand the concept being taught in class and ask questions without delay".

**4. Ease of learning:** Students reported ease in learning and stated that "Even during the closure of schools/ classes, I need not worry about lagging behind in my studies", "The use of videos, interactive slides/software by my staff makes learning fun". As reported by Khan MA et al. in their study, students

reported a positive perception towards e-learning and accepted this new learning system and stated that e-learning has now established itself as a new way of enhancing the learning process among students.<sup>10</sup>

## NEGATIVE RESPONSES

**1. Instructor's inexperience:** Students reported that "the inexperience of the instructor in handling the teaching software led to difficulties and interruption in learning" as well as "Sometimes, the equipment used by the instructor is old and causes disturbance while teaching", "Our instructor is inexperienced in muting students and some mischievous students purposefully unmute themselves or annotate on the screen" and "the instructor is inexperienced in letting students in the class after the lecture has started and various students are left in the waiting room or denied entry in the lecture". In agreement to the above statements, Ramadani A et al. reported that teachers had different experiences and challenges during online teaching, especially in assessing and evaluating and stated there is a relative difficulty to evaluate students' progress through technology.<sup>11</sup>

**2. Self-motivation and a lack of interaction:** Students documented that "I am not motivated enough to attend the lectures whole-heartedly and have to do it for the attendance", "I am unable to motivate myself to learn from online classes due to laziness; while attending college, one had to get ready as well as interacting with friends was fun" and "Lack of interaction during lectures make me feel that the teacher is doing it for completion of course and I do not find such non-interactive teaching engaging". As per Meşe E et al., students tends to lose motivation due to differences in expectations and content as well as a lack of learning environment.<sup>12</sup>

**3. Isolation:** A lack of isolation was also reported by the students; and this was in combination with the lack of interaction and due its frequent repetition, isolation was taken as a separate negative entity. "I miss not interacting with my friends" to "I feel alone at home and am unable to concentrate", to "I believe in group study and due to absence of my friends am unable to do so" and "There is nobody to discuss problems and group-study". In agreement, Croft N et al., reported that a physical and temporal separation between the teacher and student, and between students themselves, is an important factor that leads to feelings of isolation among them. The lack of interaction and discussion between students decreases the richness of the learning experience.<sup>13</sup>

**4. Missing out on practical learning:** As the students belonged to health sciences, they mostly were in the practical-based learning phase of their course which dealt with patient based interaction and treatment. Students reported that "I am a great loss due to missing patient work!! How am I going to become a good doctor if I don't practise on patients under supervision of my staff", "Seeing clinical cases online and discussing them is not enough", "The whole profession of dentistry is based on patient care and I am missing out on that only!!" and "What about the pending pre-clinical quota that needs to be completed before start treating human patients" and "I am scared that my staff will not have time to concentrate on the patient care provided by me once college commences!!".

**Limitations:** While conducting the study, there could be a possibility of the occurrence of a "social desirability bias" by the students, even though the confidentiality of their data was assured. It has been the earnest efforts of the researchers to ensure proper coding of data though proper standardization procedures as well its careful categorization of data to avoid any bias while analysing data of qualitative nature as seen in the present study.

## CONCLUSION

Based on the results of this qualitative study, it can be assumed that students are slowly adapting themselves to online based learning, although there are various challenges present. Students belonging to the healthcare sector are missing out on their practical classes and it has the potential to hamper the quality of care being provided by them as future professionals.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. Senior Resident, Department of Dentistry, UCMS & GTB Hospital, Delhi-110095 (<https://orcid.org/0000-0002-3883-6992>)
2. Senior Resident, Department of Dentistry, UCMS & GTB Hospital, Delhi-110095

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**Contact Corresponding Author at:** drkesari241288[at]gmail[dot]com