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Letter to the Editor

Caffeine addiction: Need for awareness and research and regulatory measures

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ABSTRACT

Caffeine consumption has been constantly growing in India especially among children and youngsters. Addictive potential of caffeine has long been reported, still there is lack of awareness about caffeine abuse in India. There is an intense need for appropriate public health regulatory measures and awareness about addictive potential & harms related to caffeine. To the best of our knowledge this is first case from India highlighting several important issues with progressive caffeine abuse resulting in dependence leading to physical, psychological, academic and social consequences; psychotic symptoms during intoxication; predisposing factors as impulsivity and novelty seeking traits in pre-morbid personality; psychosis in family; poor awareness of health hazards even among medical professionals. Widely variable caffeine containing products are available but caffeine content or its safety limit is not mentioned on caffeine products in India. Due to harmful consequences, legal availability to children, growing consumption of caffeine products, it is utmost essential to recognize caffeine as addictive substance and impose regulatory measures on sale, advertisement, maximum caffeine content, health consequences and safety limits of caffeine containing products. Further school teachers, parents and medical practitioners need to be made aware of health hazards of caffeine. Caffeine use shall always be enquired from patients presenting with psychiatric complaints. Further research and survey are required on caffeine use and related problems.

1. Introduction

Caffeine is psychoactive constituent of various widely available products e.g. Cola, energy drinks, chocolates, tea, coffee, analgesics, etc. It is most widely used (80% population world-wide) psychoactive substance (Silva et al., 2014; Ogawa and Ueki, 2007). In US 61% of general population consumed average 210–238 mg/day (Dews et al., 1999), whereas in UK 25% general population and 50% persons with psychiatric illness consumed more than 500 mg/day (Clementz and Dailey, 1988). A school based survey of 300 Indian students reported 97% adolescents consumed average 98 mg caffeine/day which is higher than used by US adolescents & Canadian recommendations for adolescents (85 mg/day), whereas 6% used more than 300 mg/day which has been considered harmful (Gera et al., 2016).

ICD-10 (1992) recognized caffeine as dependence producing substance (World Health Organization, 1992) and number of studies since 1993 have acknowledged addictive potential of caffeine (Ogawa and Ueki, 2007), whereas DSM-5 (2013) categorized it under conditions for further study (American Psychiatric Association, 2013). Despite of wide recognition, there is relatively lack of research as well as awareness of caffeine abuse in India.

2. Case report

A 23y unmarried male engineering student belonging to middle socioeconomic nuclear family and urban background brought by parents with complaints of coffee use since 5years, tobacco use since 3years, intermittent aggressive and assaultive behavior with inappropriate talking, gesturing and smiling to himself since 15–20 days.

Patient first started regular use of coffee at 18y age to stay awake and study at night while preparing for competitive examination. He would feel alert and concentrate better on studies after having 1.5 g coffee; hence it was not objectionable to his parents. Gradually over next few months, he increased coffee intake to 3–4.5 g/day, and over a year to 10–12 g/day in divided dose (after bed, meals and during studies). After about 2y of coffee use, he started smoking cigarette to get additional high, average 2–3 times/day. He developed insomnia and could sleep one third of previous self. After 5–6 h of previous coffee intake, he would experience withdrawals (dysphoria, irritability, restlessness, craving, mild body ache, drowsiness, fatigued, letharginess) which get relieved after consuming coffee, thus maintaining his coffee intake. He started facing consequences in his academic (missing classes and poor performance) and social life (not enjoying sports and friends). After 3y of use, his self care and appetite deteriorated and started remaining withdrawn inside his room, which made his

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hostel mates to inform his parents. On being visited by parents, he was found in poor disheveled condition with many empty coffee bottles scattered in his room. Parents consulted many psychiatrists and physicians including at premier institute, but the concerns about excessive coffee intake was neglected and was treated for bipolar affective disorder type II. Despite of parent's objection he would unable to stop coffee use and started consuming surreptitiously 7.5 gm coffee powder directly with water, easily available to him from shops. He faced minor accidents because of driving bike recklessly after coffee use. Despite of treatment his condition didn't improve, therefore he discontinued studies and started living at home since past 1.5y. He would threaten his parents and become assaultive if his daily demands for coffee was not fulfilled. With average 30–37.5 g coffee/day, his sleep and appetite got markedly reduced, and since past 15–20 days after 1–2 h of coffee use he would get excessively excited, restless, felt intense warmth, intermittent shouting, dancing and listening loud music, polydipsia, polyuria which would last for 4–5 h. Sometimes during such episodes he would have strange aggressive and staring look, self destructive behavior (burning his hand over gas, cutting his wrist with heated knife), burning his clothes, inappropriate talking to self as if replying or threatening someone, inappropriately gesturing as if fighting with someone in air, wandering away from home and assaultive if interrupted, with fleeting recall for these episodes later. His family history revealed presence of psychosis in grandmother and maternal uncle. His premorbid personality was suggestive of high impulsivity and novelty seeking traits.

He was admitted in psychiatry ward of our institute with diagnosis of caffeine dependence syndrome. Patient was poorly motivated and experienced caffeine withdrawal which was managed symptomatically. Motivational counseling, family intervention and anger management sessions were held. No psychotic symptoms were noticed during ward stay.

3. Discussion

To the best of our knowledge this is first case report from India, highlighting several important issues with progressive caffeine abuse resulting in dependence leading to physical, psychological, academic and social consequences, psychotic symptoms during intoxication, predisposing factors as impulsivity and novelty seeking traits in pre-morbid personality & psychosis in family, poor awareness of health hazards even among medical professionals.

ICD-10 had already categorized caffeine under stimulants other than cocaine, whereas DSM-5 had separated it from other stimulants. The present case met all nine DSM-5 criteria for caffeine use disorder as well as all eleven criteria for stimulant use disorder. Also presence of psychosis during caffeine intoxication was similar to that specified in ICD-10, whereas DSM-5 does not include psychotic symptoms during caffeine intoxication. The present case suggests that caffeine may be included in category of stimulant drugs. Preclinical and neurobiological studies have reported caffeine shares relatively common mechanism of action with other stimulants. Caffeine antagonizes adenosine receptors in striatum and nucleus accumbens leading to either excess dopamine secretion or up-regulation of dopamine receptors (Volkow et al., 2015).

Novelty seeking and impulsive personality traits in present case might have predisposed patient to caffeine use disorder. Novelty seeking trait is associated with low basal dopamine level, therefore heavy caffeine consumption would have increased dopamine level leading to higher salience. Similar explanation might justify higher salience with additional tobacco smoking in present case (Gurpegui et al., 2007). Family history of psychosis might have predisposed to psychosis during caffeine intoxication.

Present case highlights lack of health related awareness among people as well as medical professionals. Regular use has been found to be associated with higher trait anxiety and depression (Richards and Smith, 2016). Caffeine has been linked with higher stress, sleep disturbance, anger, violence and conduct disorder among adolescents (Thakre et al., 2015). Excessive intake may lead to psychological consequences (e.g. anxiety, headache, nausea, restlessness, insomnia, relapse/exacerbation of bipolar and psychosis, withdrawal related fatigability, irritability & drowsiness) as well as physical consequences (e.g. hypertension, cardiovascular, neurological, gastrointestinal and renal problems, overdose death) (Addicott, 2014; Silva et al., 2014; Mitchell et al., 2014; Richards and Smith, 2016).

Studies have reported moderate caffeine consumption (<300 mg/day) is not associated with health related consequences. Rather psychological (e.g. mental alertness, concentration) as well as physical (e.g. vigor, glucose tolerance, diabetes, obesity, parkinsonism, headache, cancer, etc.) benefits have also been reported (Silva et al., 2014; Mitchell et al., 2014).

Tea is considered native to Asian countries (China, Burma, India) and major source of caffeine in India particularly in North-Eastern states (Ghosh, 2013), whereas coffee consumption is though less (but estimated double than US) with 75% from southern states (Kulkarni, 2013). Indian coffee market have grown 80% in past 5 years with 5–6% current annual growth rate (Ghosh, 2013). Coffee bars like Café Coffee Day, Barista, Costa Coffee, Indian Coffee House, etc. have grown enormously, which are becoming popular among youngsters and promoting its sale with attractive advertisements. Widely variable caffeine containing products are available in market.

Currently, caffeine containing products in India do not mention caffeine content or its safety limit. Due to harmful consequences, legal availability to children, growing consumption of caffeine products, it is utmost essential to recognize caffeine as addictive substance and impose regulatory measures on sale, advertisement, maximum caffeine content, health consequences and safety limits of caffeine containing products. Further school teachers, parents and medical practitioners need to be made aware of health hazards of caffeine. Caffeine use should always be enquired from patients presenting with psychiatric complaints. Further research and survey are required on caffeine use and related problems.

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