

Serotonin syndrome after poisoning with St John's wort oil

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Abstract: Aim of this case report is to present patient with serotonin syndrome after acute poisoning with *Hypericum perforatum* oil. A 26 year-old female patient was admitted to Clinic, for altered mental status, nausea, gastrointestinal discomfort, vomiting, diarrhea, agitation, four hours after suicidal poisoning with 50 ml. St John's wort oil. On admission, she was confused, lethargic, non-communicative, with short periods of extreme agitation, disoriented with GCS 9. Her physical examination was positive for tachycardia, hypertension and elevated body temperature. Neurologic exam was positive for hyperreflexia to all for limbs, clonus on dorsiflexion of feet with positive Babinsky sign, muscular rigidity, mydriasis on both eyes. Her laboratory results revealed moderate rhabdomyolysis. Toxicology analysis were positive but in normal therapeutic range, only for Paroxetine, as part of her everyday therapy for depression. Toxicology analysis for hypericin and hyperforin was impossible to make, because we didn't have tests for it. Serotonin syndrome caused by acute poisoning with St John's oil was considered after ruling out cerebrovascular accidents and infection as potential etiologies for the patient's condition. The treatment started with one dose of Diazepam (5mg IV push), and another 6 hours later, than continued with aggressively hydration (saline and dextrose fluids, with bicarbonates), 80 mg Propranolol and 40 mg Furosemid. The patient was rapidly cooled, and we continued in next twelve hours. Within 24 hours, the patient's mental status and physical status totally improved and she was transferred to Clinic for Psychiatry for further treatment.

Keywords: St John's wort, poisoning, serotonin syndrome.

INTRODUCTION

St John's wort or *Hypericum perforatum* is native to Europe and Asia but has spread worldwide as an invasive species, including to temperate regions of India, China, Canada and the United States[1]. This plant has been used as an herbal remedy for its anti-inflammatory and healing properties since the middle Ages[2]. Today is known, that the genus *Hypericum* has an exceedingly complex and diverse chemical makeup. *H. perforatum* has been most intensively studied, but there is data available on 66 other species[3]. The compounds that have been identified from the plant can be divided in several classes, but the main two active components are hypericin and hyperforin[4]. This plant possesses antimicrobial properties and is used to treat depression; however, it has been implicated in drug interactions[5,6]. St John's wort is generally well tolerated, with an adverse effect profile similar to placebo [7]. Commonly reported adverse effects include gastrointestinal symptoms (nausea, abdominal pain, loss of appetite, and diarrhea), dizziness, confusion, fatigue, sedation, dry mouth, restlessness, and headache[8]. The organ systems associated with adverse drug reactions to St John's wort and Paroxetine (a SSRI) have an analogous incidence profile, most of these reactions

involve the central nervous system[9]. Serotonin syndrome (SS) after use, abuse, overdose or intoxication with *Hypericum perforatum* is theoretically well-known, even in practice there are only several published cases[10].

Aim of this case report is to present patient with moderate serotonin syndrome after acute poisoning with homemade *Hypericum perforatum* oil.

CASE REPORT

A 26 year-old female patient was admitted to University Clinic for Toxicology in Skopje, Republic of Macedonia, by her family, for altered mental status, nausea, gastrointestinal discomfort, vomiting, diarrhea, agitation, four hours after acute suicidal poisoning with approximately 50 ml. homemade St John's wort oil. On admission, she was confused, lethargic, non-communicative, with short periods of extreme agitation, disoriented with Glasgow Coma Score 9. Her physical examination was positive for tachycardia (145 beats/minute), hypertension (155/99 mmHg) and elevated body temperature (39.6 C⁰). Neurologic exam was positive for hyperreflexia to all four limbs, clonus on dorsiflexion of feet with positive Babinsky sign, muscular rigidity, mydriasis on both eyes. Her

laboratory results revealed moderate rhabdomyolysis (creatinine phosphokinase 488). Toxicology analysis were positive but in normal therapeutic range, only for Paroxetine, (plasma concentration 26 ng/mL), as part of her everyday therapy for depression. Toxicology analysis for hypericin and hyperforin was impossible to make, because we didn't have tests for it. Computerized tomography of head was unremarkable. Serotonin syndrome caused by acute poisoning with St John's oil was considered after ruling out cerebrovascular accidents and infection as potential etiologies for the patient's condition. The treatment started with one dose of Diazepam (5mg IV push), and another 6 hours later, than continued with aggressively hydration (saline and dextrose fluids, with bicarbonates), 80 mg Propranolol and 40 mg Furosemid. The patient was rapidly cooled, and we continued to cool her in next twelve hours. Within 24 hours, the patient's mental status and physical status totally improved and she was transferred to University Clinic for Psychiatry for further treatment.

DISCUSSION

We report a rare unique case of serotonin syndrome, developed after acute suicidal poisoning with John's wort oil. Our patient was treated with Paroxetine before her hospitalization, for her depression. The interaction of St John's wort with Paroxetine is the probable main reason of developing serotonin syndrome in our patient. St John's wort has been shown to cause multiple drug interactions through induction of the cytochrome P450 enzymes CYP3A4 and CYP1A2 (females only). This drug-metabolizing enzyme induction results in the increased metabolism of certain drugs, leading to decreased plasma concentration and potential clinical effect[11]. The principal constituents thought to be responsible are hyperforin and amentoflavone. St John's wort has also been shown to cause drug interactions through the induction of the P-glycoprotein efflux transporter. Increased P-glycoprotein expression results in decreased absorption and increased clearance of certain drugs, leading to lower plasma concentration and potential clinical efficacy[12]. In combination with other drugs that may elevate 5-HT (serotonin) levels in the central nervous system (CNS), St John's wort may contribute to serotonin syndrome, a potentially life-threatening adverse drug reaction [13]. St John's wort is known to interact with selective serotonin reuptake inhibitors (SSRIs), as in our case, in the same way as serotonergic drugs such as tramadol and citalopram, by further increasing the serotonin level in the brain[14]. Serotonin syndrome is a set of symptoms which result in the hyperstimulation of central and peripheral serotonin receptors following a large increase in the level of serotonin in the organism after taking one or more serotonin agents [15]. Serotonin syndrome is well documented in the literature, but it remains under-diagnosed because of the non-specificity of the

symptoms; 85% of the syndromes go undiagnosed [16]. The clinical symptomatology is very variable, ranging from very mild, as in our case, to life-threatening [17]. Similar case to our one, is reported in Medsafe on March 2012. The report describes a patient who was started on low dose citalopram one day after ingesting "Be Happy" tea. After just two doses of citalopram, the patient developed symptoms consistent with moderate serotonin syndrome [18]. "Be Happy" tea lists 820 mg of St John's wort per tea bag.

CONCLUSION

St John's wort is a safe remedy, but in acute poisoning can provoke a life treating serotonin syndrome.

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