Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 10, Issue, 08, pp.72748-72750, August, 2018

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

EFFECT OF WITHANIA SOMNIFERA (ASHWAGANDHA) IN OBSESSIVE COMPULSIVE DISORDER ON ALBINO RATS

Dr. Sangita Totade and *Dr. Ameya Puranik

Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha, India

ARTICLE INFO

Article History:
Received 08th May, 2018
Received in revised form
14th June, 2018
Accepted 10th July, 2018
Published online 30th August, 2018

Key Words:

Helicobacter pylori,
Standard therapy,
Sequential therapy,
Eradication.

ABSTRACT

Background: Albino rats have natural tendency of burying behavior, more when they are under stress, this provides an useful model for study of Obsessive Compulsive Disorders.

Aim and Objectives:

1. To observe effectiveness of Withania Somnifera in Obsessive compulsive disorder.
2. To observe effect of Withania Somnifera in Obsessive Compulsive Disorder on Albino rats.
3. To evaluate appropriate dosage of WithaniaSomnifera for Obsessive Compulsive Disorder.

Methods: Rats are divided into six groups, the control group was given normal saline and other groups received Withania Somnifera (Ashwagandha) in increasing doses. The rats were placed in a box with marbles in each and the burying behavior is obsereved.

Results: It was obserevedthat, the increasing dosage of Withania Somnifera less marbles are buried by rats. In control group 15 out of 18 marbles are found buried on an average, with 50mg/kg 12 marbles on an average are buried, with 100 mg/kg 8 marbles are found to be buried and with 200 mg/kg only 5 marbles are buried after one hour.

Conclusion: Withania Somnifera (Ashwagandha) is effective in treating Obsessive Compulsive Disorders in Rats.

Citation: ***Dr. Sangita Totade and Dr. Ameya Puranik*, 2018.** "Effect of withani a somnifera (Ashwagandha) in obsessive compulsive disorder on albino rats", *International Journal of Current Research*, 10, (08), 72748-72750.

INTRODUCTION

Obsessive compulsive disorder (OCD) is a disabling psychiatric condition characterized by the presence of upsetting, persistent thoughts, images, or impulses that are experienced as intrusive and senseless, and which cause marked distress or anxiety (obsessions) and/or excessive repetitive intentional behaviors or mental acts (compulsions) intended to neutralize this distress (American Psychiatric Association, 2013). The disorder has a lifetime prevalence of 2.3%,and it significantly interferes with social adjustment, employment, marriage, family relationships, and socioeconomic status (Kessler *et al.,* 2005; Murray, 1997; Markarian, 2010). Over the last 30 years, many attempts have been made to develop animal models of OCD under the hypothesis that, as in other neuropsychiatric disorders, they could be useful to disentangle the genetic, neurochemical, and neuroanatomical substrates of the disorder, as well as helping to develop novel treatments and to characterize the mechanism by which these treatments exert their beneficial influences (Gyertyán, 1995; Londei *et al.,* 1998; Njung'e and Handley, 1991).

Corresponding author: **Dr. Ameya Puranik,**
Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha, India.
DOI: https://doi.org/10.24941/ijcr.31868.08.2018

The marble-burying test is probably the most cost-effective animal model of OCD, since it requires no behavioral training and no pharmacological manipulation. Consequently, it is one of the most widely studied, alongside the 8-OHDPAT-induced decreased alternation model that requires limited behavioral training and acute administration of 8-OHDPAT. There are many reports that burying behavior in male mice and rats is decreased by the administration of SSRIs at doses that do not affect locomotoractivity (Thomas *et al.,* 2009; Egashira *et al.,* 2008; Ichimaru *et al.,* 1995; Krass *et al.,* 2010; Schneider and Popik, 2007; Takeuchi *et al.,* 1992; Uday *et al.,* 2007; Broekkamp *et al.,* 1986; Arora *et al.,* 2013; Umathe *et al.,* 2009). Inhibition of natural rodent behavior involving the burying of both noxious and harmless objects was originally hypothesized to constitute a screening test for anxiolytic activity because the duration and extent of burying objects were reduced by different anxiolytic drugs. However, it was later argued that the model does not mimic anxiety but may rather be related to compulsive behaviors (Gyertyán, 1995; Londei *et al.,* 1998; Njung'e and Handley, 1991; Thomas *et al.,* 2009; Egashira *et al.,* 2007). Mice were found not to avoid marbles when given the opportunity to do so, suggesting that they have no aversive or fear-provoking properties and repeated exposure to marbles did not lead to habituation of marble burying, indicating that this behavior was not related to

novelty or fear (Njung'e and Handley, 1991; Thomas *et al.,* 2009).

REVIEW OF LITERATURE

Withaniasomnifera, known commonly as *ashwagandha*, is a plant of solanaceae or Nightshade family. Several species of withinia a morphologically similar. It is a medicinal herb used since ancient time in India. *Withaniasomnifera* is found to have psychoactive properties recently (Kulkarni and Dhir, 2008; Kumar *et al.,* 2015; Umadevi *et al.,* 2012; Wadhwa *et al.,* 2005). Recent observations made during our exploratory dose-finding studies have revealed that fairly low daily oral dose of *W. somnifera* extracts increases stress resistance in laboratory rodents, and indicated that their anxiolytics or antidepressants like effectiveness in stressed mice increases with increasing number of treatment days (Thakur *et al.,* 2015; Dey *et al.,* 2014).

Aim: To observe effectiveness of Withania Somnifera in Obsessive compulsive disorder.

Objectives

1. To observe effect of Withania Somnifera in Obsessive Compulsive Disorder on Albino rats.
2. To evaluate appropriate dosage of Withania Somnifera for Obsessive Compulsive Disorder.

MATERIALS AND METHODS

Locus of Study-Department of Pharmacology, J.N.M.C Sawangi (Meghe) Wardha Maharashtra, India
Duration of study- 6 months
Study Type- Experimental study in Albino rats.
Animal Ethics Committee Permission- The study was initiated only after obtaining permission from the animal Ethics Committee of the institution.

Materials

Animals: Male/Female, Albino rats, Weight 150-250gms.

Chemical Required

Test drug – Purified extract of Withinia Somnifera extract obtained by decoction method.

Route: Oral

Dose: 50,100 and 200 mg/kg per oral doses suspended in the distilled water.

Grouping of animals: 24 in number albino male rats, weighing 150-250gms will be divided into four groups of 06 rats each by the method of random allocation.

Methodology

All test groups will receive corresponding amount of Purified extract of Withania Somnifera obtained by decoction method of purification, 60 minutes prior to the marble burying test. Control group will receive 0.9% normal saline or vehicle of the extract, and marble burying behavior of each group is observed.

Marble burying test

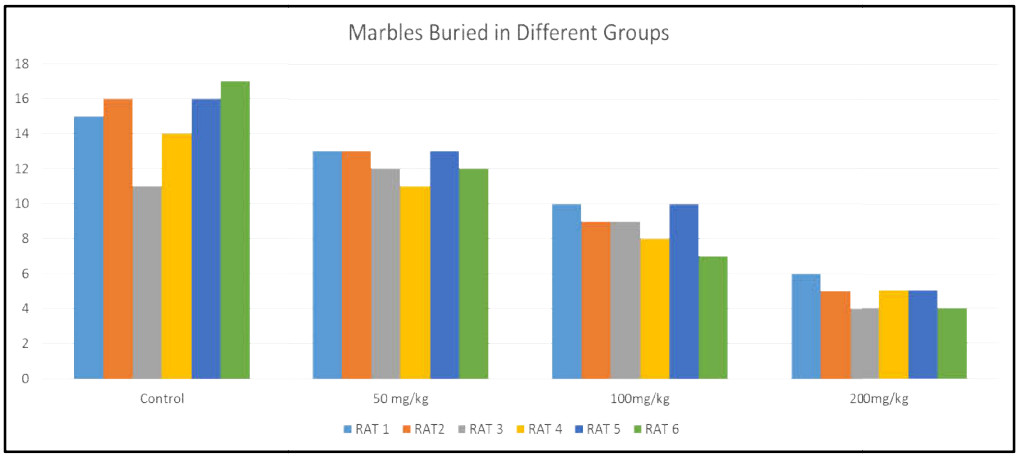
Rats are given appropriate dosage of test drug and individually placed in identical separate cages containing evenly placed 18 clean glass marbles 10mm in diameter evenly placed on 5mm saw dust. After 60 minutes of exposure to the marbles, mice shall removed and results are expressed as number of marbles at least two-third in saw dust. The total number of marbles buried are considered as an index of obsessive compulsive behavior.

RESULTS

From the below table Table 1 it is clear that, with the increasing dosage of Withania Somnifera less marbles are buried by rats. In control group 15 out of 18 marbles are found buried on an average, with 50mg/kg 12 marbles on an average are buried, with 100 mg/kg 8 marbles are found to be buried and with 200 mg/kg only 5 marbles are buried after one hour.

Table 1.

Groups	RAT 1	RAT2	RAT 3	RAT 4	RAT 5	RAT 6	Mean marbles buried
Control	15	16	11	14	16	17	15
50 mg/kg	13	13	12	11	13	12	12
100mg/kg	10	09	09	08	10	07	08
200mg/kg	06	05	04	05	05	04	05



DISCUSSION

In the pharmacological investigations performed in this study, the possible influence of W. Somnifera was studied by marble burying test, and it is observed from the above results that increasing doses of Withania Sominfera (Ashwagandha) from 50 mg/kg to 200 mg/kg, decreases obsessive-compulsive burying behavior of rats. With the dose of 200 mg/kg the burying of rats has been drastically suppressed. Similar experiment conducted by Bhanu PS Kaurav et al at Department of Pharmacology, R.K.D.F. College of Pharmacy, Bhopal M.P. India on Albino mice given Ashwagandha intraperitoneally has found decrease in marble burying after 10 mg /kg to be 11 to 12 marbles, after 25 mg/kg to be 4 to 5 marbles, 50 mg/kg 1 to 2 marbles and 100 mg/kg to be 0 to 1 marblesare found to be worried while in our experiment ashwagandha when given by oral route the results are found to be 12 marbles after 50 mg/kg, 8 marbles after 100 mg/kg and 5 marbles after 200 mg/kg. Another experiment conducted by Bhattacharya et al at Department of Pharmacology, Postgraduate Institute of Basic Medical Sciences, Calcutta University about adaptogenic activity of Withania Somnifera in chronic stressed induced rats showed that chronic induced perturbations were attenuated by WS (25 and 50 mg/kg) given per orally, administered 1 h before foot-shock for 21 days. The results indicate that Withania Somnifera, has significant antistress adaptogenic activity, confirming the clinical use of the plant in Ayurveda while our study has shown significant reduction in marble burying in non-stressed induced rats.

Limitations

- Stressed was not induced in test rats.
- Drug is given orally, but ideal route for this experiment is intraperitoneal.

Conclusion

It is concluded from the above experiment that Withania Somnifera (Ashwagandha) Purified extract when given per orally to Albino Rats per orally, can decrease naturally occurring compulsive burying habit of rats. With increasing doses less and less marbles are observed to be buried by rats. The 200 mg/kg i.e. highest dose used in this experiment is found to have drastically reduced the obsessive-compulsive habit to rats. Further pharmacokinetic and toxicity studies are needed to conclude that Ashwagandha has potiential to be tried for human studies for Obsessive – Compulsive disorder as an alternative to traditional drugs.

REFERENCES

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC: APA; 2013.

Arora T, Bhowmik M, Khanam R, Vohora D. 2013. Oxcarbazepine and fluoxetine protect against mouse models of obsessive compulsive disorder through modulation of cortical serotonin and creb pathway. *Behav Brain Res.,* 247:146–152.

Broekkamp CL, Rijk HW, Joly-Gelouin D, Lloyd KL. 1986. Major tranquillizers can be distinguished from minor tranquillizers on the basis of effects on marble burying and swim-induced grooming in mice. *Eur J Pharmacol.,* 126:223–229.

Dey A, Chatterjee SS, Kumar V. 2014. Comparison of the adaptogenic efficacy of three different Withaniasomnifera extracts in mice. *Indian J Pharmacol,* 46:S87.

Egashira N, Harada S, Okuno R, et al. 2007. Involvement of the sigma1 receptor in inhibiting activity of fluvoxamine on marble-burying behavior: comparison with paroxetine. *Eur J Pharmacol.,* 563:149–154.

Egashira N, Okuno R, Harada S, et al. 2008. Effects of glutamate-related drugs on marble burying behavior in mice: implications for obsessive-compulsive disorder. *Eur J Pharmacol.,* 586:164–170.

Gyertyán I. 1995. Analysis of the marble burying response: marbles serve to measure digging rather than evoke burying. *Behav Pharmacol.,* 6:24–31.

Ichimaru Y, Egawa T, Sawa A. 1995. 5-HT1A-receptor subtype mediates the effect of fluvoxamine, a selective serotonin reuptake inhibitor, on marble-burying behavior in mice. *Jpn J Pharmacol.,* 68:65–70.

Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. 2005. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry,* 62(6):593–602.

Krass M, Rünkorg K, Wegener G, Volke V. 2010. Nitric oxide is involved in the regulation of marble-burying behavior. *Neurosci Lett.,* 480:55–58.

Kulkarni SK, Dhir A. 2008. Withaniasomnifera: An Indian ginseng. *Prog Neuropsychopharmacol Biol Psychiatry*, 32:1093–105. [PubMed]

Kumar V, DeyA, Hadimani MB, Marcović T, Emerald M. 2015. Chemistry and pharmacology of Withaniasomnifera: An update. *TANG [Hum Med],* 5:e1.

Londei T, Valentini AMV, Leone VG. 1998. Investigative burying by labora¬tory mice may involve non-functional, compulsive, behaviour. *Behav Brain Res.,* 94:249–254.

Markarian Y, Larson MJ, Aldea MA, et al. 2010. Multiple pathways to functional impairment in obsessive-compulsive disorder. *Clin Psychol Rev.,* 30(1):78–88.

Murray C, Lopez AD. 1997. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet*, 349:1436–1442.

Njung'e K, Handley SL. 1991. Evaluation of marble-burying behavior as a model of anxiety. *Pharmacol Biochem Behav.,* 38:63–67.

Schneider T, Popik P. 2007. Attenuation of estrous cycle-dependent marble burying in female rats by acute treatment with progesterone and anti¬depressants. *Psychoneuroendocrinology*, 32:651–659.

Takeuchi H, Yatsugi S, Yamaguchi T. 2002. Effect of YM992, a novel antidepressant with selective serotonin re-uptake inhibitory and 5-HT 2A receptor antagonistic activity, on a marble-burying behavior test as an obsessive-compulsive disorder model. *Jpn J Pharmacol.,* 90:197–200.

Thakur AK, Dey A, Chatterjee SS, Kumar V. 2015. Reverse Ayurvedic pharmacology of ashwagandha as an adaptogenic anti-diabetic plant: A pilot study. *Curr Tradit Med.,* 1:51–61.

Thomas A, Burant A, Bui N, Graham D, Yuva-Paylor LA, Paylor R. 2009. Marble burying reflects a repetitive and perseverative behavior more than novelty-induced anxiety. *Psychopharmacology (Berl),* 204:361–373.

Uday G, Pravinkumar B, Manish W, Sudhir U. 2007. LHRH antagonist attenuates the effect of fluoxetine on marble-burying behavior in mice. *Eur J Pharmacol.,* 563:155–159.

Umadevi M, Rajeswari R, Rahale CS, Selvavenkadesh S, Pushpa R, Kumar KS, et al. 2012. Traditional and medicinal uses of Withaniasomnifera. *Pharm Innov.,* 1:102–10.

Umathe SN, Vaghasiya JM, Jain NS, Dixit PV. 2009. Neurosteroidsmodulate compulsive and persistent behavior in rodents: implications for obsessive-compulsive disorder. *Prog Neuropsychopharmacol Biol Psychiatry,* 33:1161–1166.

Wadhwa R, Konar A, Kaul SC. 2015. Nootropic potential of Ashwagandha leaves: Beyond traditional root extracts. *Neurochem Int.,* pii: S0197-018630043-7. [PubMed]

****