

## COMPARISON OF EFFICACY AND SAFETY OF TWO DIFFERENT BOLUS DOSES OF OXYTOCIN DURING CAESAREAN DELIVERY

Mude Nage Ramesh Kumar<sup>1</sup>, Sreenivasulu Yadav Surineni<sup>1</sup>, Paritala Subba Rao<sup>2</sup>

<sup>1</sup>Assistant Professors, Department of Anaesthesiology, S.V. Medical College, Tirupati, Dr. Y. S. R. University of Health Sciences, Andhra Pradesh, India.

<sup>2</sup>Associate Professor, Department of Anaesthesiology, S.V. Medical College, Tirupati, Dr. Y.S.R University of Health Sciences, Andhra Pradesh, India

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Corresponding Author:

Dr. Mohana Krishna Reddy,

Email: mkreddydoctor@gmail.com

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### Abstract

**Background:** The optimal dose of oxytocin at caesarean section is unclear. Oxytocin may cause adverse cardiovascular effects, including tachycardia and hypotension, whereas an inadequate dose can result in increased uterine bleeding. We compared the effects of two doses of oxytocin in our study. The study aimed to find out which among the two different bolus doses of Oxytocin gives adequate Uterine Tone with the least hemodynamic effects and adverse effects during caesarean delivery. **Materials and Methods:** A total of seventy patients with 35 in each group undergoing elective caesarean section under spinal anesthesia received an I.V bolus of oxytocin 2 or 5 units immediately after baby delivery, followed by oxytocin infusion 5 units per hour. The two groups were compared about uterine tone assessment, the need for additional uterotonic drugs, hemodynamic changes and adverse drug effects. **Result:** Patient characteristics were comparable between the two groups. Uterine tone scores were comparable at 2 min. There was a statistically significant difference between the two groups at the 5th minute. Clinically acceptable uterine tone assessed during the entire study period showed a significant difference at the 5th minute. Percentage increase in the mean maternal HR was found to be significantly different at 1st min( $p=0.002$ ). There was no significant maternal tachycardia between the groups. There was a significant difference in the systolic blood pressure at 1,2,3,4,15,18 and 21 min when compared to the baseline. During the entire study period, there was a significant difference in the diastolic blood pressure between the two groups. There was no significant difference in the event of adverse events like nausea and vomiting. There was a significant difference in the need for phenylephrine boluses with the higher requirement in the group O-5. **Conclusion:** Two units of oxytocin bolus followed by an infusion of 5 units per hour has a favourable efficacy and safety profile in healthy adult women undergoing elective caesarean delivery.

## INTRODUCTION

Caesarean section is one of the most commonly performed surgeries in women during their childbearing age throughout the world, the numbers have escalated over the past three decades. The operative morbidity of caesarean section may include uterine atony which can lead to peripartum haemorrhage and anaemia, risks of blood transfusion, need for hysterectomy, and in severe cases, even maternal death. Obstetric haemorrhage is the leading cause of maternal mortality worldwide, and in most cases, it relates to uterine atony. Consequently, the administration of uterotonic drugs is essential for the prevention of postpartum haemorrhage. Oxytocin is

the first choice agent for enhancing uterine contraction and minimizing blood loss after delivery.

## MATERIALS AND METHODS

The cross sectional study was conducted in department of psychiatry, government general hospital, Kurnool, from July 2022-Sep 2022. A convenient sample size of 200 care givers of psychiatric patients was taken after obtaining approval by the institutional ethical committee. For comparing the burden level among various illness 50 study subjects each were selected from schizophrenia, dementia, bipolar and substance abuse disorder. The study subjects included in the study were (a) caregivers of major psychiatric illness such

as schizophrenia, bipolar affective disorder, dementia, and major depressive disorder as diagnosed by the International Classification of Diseases 10 (ICD 10) criteria (b) caregivers who have given consent to participate in the study, (c) caregivers of outpatients suffering from major psychiatric illness for a period not <2 years, and who are living with the patient, (d) caretakers of age group between 20 and 70 years. Caregivers of patients with any psychiatric illness other than those mentioned above and caregivers with preexisting major psychiatric illness were excluded from the study.

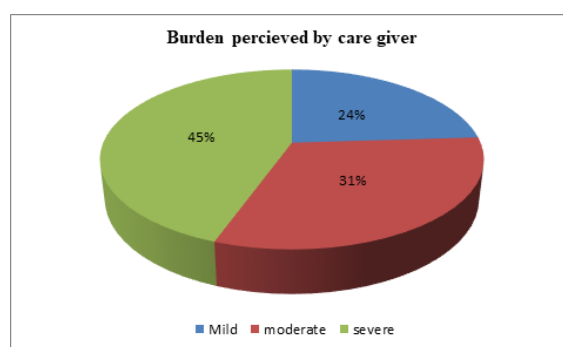
1. Study tools used in the study were (a) Socio demographic data: Socio-demographic characteristics and diagnosis of caregiver's relatives were elicited. They were age, gender, religion, education, marital status, occupation, monthly income, duration of illness, and perception of health problems with the psychiatric ill patient.
2. Burden of Care (BOC) schedule. The caregiver burden was assessed using the Zarit Burden Interview (ZBI) questionnaire(7) . The ZBI is a 22-item tool with 5-point likert scale (ranging from 0–4) that have responses as follows; never, rarely, sometimes, quite frequently and nearly always. Therefore, the overall summated scores of the 22 items range from 0–88. It was assessed as 0 to 20 score- No or minimal burden, 21 to 40 score -Mild to moderate burden, 41-60 score - Moderate to severe burden, 61 to 88 score-. Severe burden.

**Data collection procedure:** Caregivers were explained in detail about the study in their language and the informed consent was taken. All the caregivers were described about the essence of the study in every aspect. Data was collected by face to face interviewing using sociodemographic and zarit burden interview questionnaire. Interview was conducted by maintaining privacy and confidentiality of each participant throughout the study.

**Data analysis:** The collected data were checked for completeness, organized, coded and entered in Microsoft EXCEL and analyzed using Statistical Package for the Social Sciences, version 26.0 (IBM Corporation, New York, USA). Descriptive statistics (frequency, percentage) were calculated to find the status of socio-demographic variables and inferential statistics Chi-square test was applied to find out the relationship between caregiver's burden, taking 95% confidence, 5% permissible error and p value=0.05 were used to analyze the data . Analyzed data and results were presented through tables and figures.

## RESULTS

In the present study majority of caregivers were females 66.5% than males. The mean age of the participants was 42.5(standard deviation-8.02). Among the study subjects of 30% were between 21-40years, 33% were between 41-60 years and 22% were >60years. Marital status of caregivers, majority were single-32%, married were 24.5%. majority of the study subjects were illiterate with 53.5%, only 25.5% had primary education and 21% had secondary education. Nearly 51% belong to hindu religion. Majority of participants belong to lower Socioeconomic status based on modified BGPrasad classification which was 33% about 36% of caregiver gave care for less than 5 years and 31.5% of caregiver gave care for 11-15 years duration shown in [Table 1] socio demographic data.



**Figure 1: Burden perceived by care giver**

Perception of caregiver burden found in the present study was mild in 24%, moderate in 31% and severe in 45% shown in [Figure 1]. While comparing the level of burden perceived in psychiatric ill patients, burden experienced in substance abuse disorder was more with 56% followed by schizophrenia 52% and dementia 48% shown in [Table 2].

Perception of caregiver burden in relation to sociodemographic data, female experienced severe burden in comparison to male this difference was statistically significant(p<0.05). caregivers aged between 21-40 years experienced severe burden than other age groups, this was statistically significant(p<0.05). Participants belonging to Lower socioeconomic status experienced severe burden which was statistically significant(p=0.05). Care duration of less than 5 years given by caregivers experienced severe burden and it was statistically significant [Table 3].

**Table 1: Socio-demographic data**

Characteristic	Category	Frequency	Percentage
Gender	Male	67	33.5
	Female	133	66.5
Age (in years)	<20 years	31	15.5
	21-40 years	59	29.5
	41-60 years	66	33
	>60 years	44	22
Marital status	Married	49	24.5

	Single	64	32
	Widow/widower	33	16.5
	Divorced	54	27
Religion	Hindu	102	51
	Muslim	55	27.5
	Christian	43	21.5
Education	Primary school	51	25.5
	Secondary school	42	21
Socio economic status	Upper middle	47	23.5
	middle	41	20.5
	Lower middle	46	23
	lower	66	33
	No school	107	53.5
Occupation	Agriculture	74	37
	Home maker	66	33
	Service/job	36	18
	Unemployed	24	12
Duration of caregiving	2-5 years	72	36
	6-10years	24	12
	11-15 years	63	31.5
	16-20years	41	20.5

**Table 2: Comparison to the caregiver burden associated with various psychiatric illness patients**

Diseases	Mild	Moderate	Severe
Bipolar	30(60%)	9(18%)	11(22%)
Dementia	6(12%)	20(40%)	24(48%)
Schizophrenia	5(10%)	19(38%)	26(52%)
Substance abuse	7(14%)	15(30%)	28(56%)

$\chi^2$ - 48.85, P value-0.0001

**Table 3: Perception of caregiver burden in relation to sociodemographic data**

Characteristic	Category	Mild	Moderate	Severe	Total	Significant
Gender	Male	23	24	20	67	$\chi^2$ -9.93 Pvalue-0.007
	Female	25	39	69	133	
Age(in years)	<20 years	6	5	20	31	$\chi^2$ -47.57 Pvalue-0.000
	21-40 years	9	7	43	59	
	41-60 years	21	27	18	66	
	>60 years	12	24	8	44	
Marital status	married	16	10	23	49	$\chi^2$ -22.60 Pvalue-0.001
	single	19	20	25	64	
	Widow/widower	6	5	22	33	
	Divorced	7	28	19	54	
Religion	Hindu	27	32	43	102	$\chi^2$ -4.09 Pvalue-0.394
	Muslim	15	14	26	55	
	Christian	6	17	20	43	
Education	Primary school	11	12	28	51	$\chi^2$ -15.04 Pvalue-0.005
	Secondary school	13	21	8	42	
	No school	24	30	53	107	
Occupation	Agriculture	20	26	28	74	$\chi^2$ -2.87 Pvalue-0.825
	Home maker	15	19	32	66	
	Service/job	9	11	16	36	
	Unemployed	4	7	13	24	
Socio economic status	Upper middle	17	9	21	47	$\chi^2$ -12.13 Pvalue-0.05
	middle	11	10	20	41	
	Lower middle	8	15	23	46	
	lower	12	29	25	66	
Duration of caregiving	2-5years	24	11	37	72	$\chi^2$ -22.92 Pvalue-0.001
	6-10years	6	7	11	24	
	11-15 years	8	33	22	63	
	16-20years	10	12	19	41	

## DISCUSSION

The present study mean age of caregivers was found to be 42.5 years, around 33% were between the age group of 41-60years this was contrary to study done gupta p et al 8mean age was 38.47 years and majority of study subjects were less than 30 years. In study done by Agarwal M it has been observed that maximum number of the caretakers (34%) were of

the age group 42– 54 years that was similar to our study.<sup>[9]</sup>

Burden was more experienced in female care givers than in male care givers in our study. This observation was similar to that of Bedard M et al,<sup>[10]</sup> who concluded that women had more burden than male care givers. It was contrary to that of swaroopa RSA et al,<sup>[11]</sup> this could be because males are the usual bread winners in families and owing to this fact

it would be apparently difficult for a person to strike the balance between professional and family responsibilities

In the factor that the perception of caregiver's burden due to patient's illness, it was found the caregivers burden as mild-24%, moderate-31%, severe-45%. In a study done by Akhilesh M et al,<sup>[12]</sup> found 39% experienced mild burden, 52% had moderate levels of burden, and 9% had severe burden levels.

In the study by Shamsaeiet al,<sup>[13]</sup> the result showed that the majority of the population (41.8%) experienced moderate-to-severe burden and 7.6% experienced "no to low" burden, 23.5% "mild to moderate," and 27.1% "severe" burden. The severity of burden is different because the sample population in the above study were patients with schizophrenia only, whereas we had four different groups of patients with different diagnosis.

Caregiver burden in comparison between carers of patients with schizophrenia, substance abuse and dementia were 56%, 52%, 48% respectively. Shekhawat BS et al,<sup>[14]</sup> observed more caregiver burden in substance abuse. Care giver burden scores in our study were high compared to previous studies done by Anupama Rammohan et al.<sup>[15]</sup> A study by Parija et al,<sup>[24]</sup> in which there was a significantly higher total burden in caregivers of patients with schizophrenia (psychotic disorder) compared to bipolar affective disorder (BPAD) (mood disorder) and the  $P = 0.01$  which is similar to our study. Another study by Bora and Das,<sup>[25]</sup> favoring our findings reported that the mean burden score for chronic schizophrenia group was  $102.86 \pm 27.04$ , whereas the mean BAS score for the BPAD group was  $88.80 \pm 22.31$ . Caregivers of chronic schizophrenia experienced significantly higher burden than the caregivers of BPAD ( $P = 0.03$ ).

According to the study by Solanki et al,<sup>[23]</sup> the burden and attitude of schizophrenic patients' caregivers were statistical significant ( $P \leq 0.001$ ) supporting our results which observed a significant association with the level of burden.<sup>[26]</sup>

Relation to sociodemographic data a significant association was found in low socioeconomic status and duration of care provided to psychiatric patients which is similar to study done by swaroopa RSA et al,<sup>[11]</sup> who concluded that Poor financial status makes it difficult to avail better and appropriate treatment for the patients, which resulted in the progression of disease to a chronic and resistant one. This is consistent with previous literature – low caregiver resources were found to be significantly associated with increased caregiver burden.<sup>[16]</sup>

## CONCLUSION

This study has shown significantly high burden in caregivers of psychiatric illness patients such as bipolar, substance abuse, schizophrenia and dementia. Caregiver burden also established

significant relation with gender, low education and low socioeconomic status.

Caregivers health is important, if neglected they can have adverse effects on them as well on the patients . Experiences of strain and interference in their personal life from committing time and resources to the care of their ill relatives presents as some of the components of burden of caring for a mentally ill family relative. Psycho-education of the caregiver and skills training such as mood and coping mechanisms can reduce the caregiver burden. Specific management strategies have to be designed in account to improve the caregiver efficiency to manage both patient and care giver. Advocacy for caregivers to be regularly screened for probable psychological morbidity and burden of care for early identification and intervention is needed.

## Limitations

The study cannot be generalized to the community as the study population was from a hospital-based population. Our study is limited by the small sample size and it's cross

sectional design. Factors such as personality, any comorbid physical illness, expressed emotions from caregivers, or other conflicts in the family which could have impacted on caregiver burden were not examined. Furthermore, the cross-sectional nature of our study limited causal inferences. Longitudinal data would have given further insight into the extent of burden among caregivers.

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## REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington: American Psychiatric Association; 2013.
2. Ampalam P, Gunturu S, Padma V. A comparative study of caregiver burden in psychiatric illness and chronic medical illness. *Indian J Psychiatry*. 2012;54(3):239–43.
3. Negash A. Bipolar disorders in rural Ethiopia: community-based studies in Butajira for screening, epidemiology, follow-up and the burden of care. Umea University, Umea; 2009.
4. Ravi S, Goud BR, Archana M, Pius TM, Pal A, John V, et al. Burden among caregivers of mentally-ill patients: A rural community – Based study community medicine. *Int J Res Dev Health*. 2013;1:29–34.
5. Grover S, Pradyumna, Chakrabarti S. Coping among the caregivers of patients with schizophrenia. *Ind Psychiatry J*. 2015;24:5–11.
6. Walke, S. C., Chandrasekaran, V., &Mayya, S. S. (2018). Caregiver Burden among Caregivers of Mentally Ill Individuals and Their Coping Mechanisms. *Journal of neurosciences in rural practice*, 9(2), 180–185.
7. Zarit SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: Correlates of feelings of burden. *Gerontologist* 1980;20:649-55.
8. Gupta P, Bharti P, Bathla M, Singh AH, Bhusri L. A cross-sectional study to assess the caregiver burden and the quality of life of caregivers of the patients suffering with psychiatric illness. *Ind Psychiatry J* 2022;31:151-7.

9. Agarwal M, Kushwaha A, Nischal A, Kar SK, Gupta B, Tripathi A, et al. Burden of care in the caregivers of patients with anxiety disorders. *Indian J Soc Psychiatry* 2017;33:22-8.
10. Bédard MI, Kuzik R, Chambers L, Molloy DW, Dubois S, Lever JA. Understanding burden differences between men and women caregivers: the contribution of care recipient problem behaviors. *IntPsychogeriatr* 2005;17:99-118.
11. Swaroop RSA, Samrat K, Pavankumar CMR, Sharbandh VR. Care giver burden in psychiatric illness. *AP J Psychol Med* 2015; 16(1): 62-8.
12. Akhilesh M, Priyamkari A, Kakunje A, Karkal R. Cross sectional study on burden and psychiatric morbidity in the caregivers of patients of major psychiatric illness in a tertiary healthcare centre. *Arch Ment Health* 2021;22:98-104.
13. Shamsaei F, Cheraghi F, Bashirian S. Burden on family caregivers caring for patients with schizophrenia. *Iran J Psychiatry* 2015;10:239-45.
14. Shekhawat BS, Jain S, Solanki HK. Caregiver burden on wives of substance-dependent husbands and its correlates at a Tertiary Care Centre in Northern India. *Indian J Public Health* 2017;61:274-7.
15. Anupamarammohan, Kiran rao, D.K.Subbakrishna, Burden and coping in caregivers of persons with schizophrenia, *Indian Journal of Psychiatry*, 2002,44(3)220-227.
16. Martens, L., &Addington, J. The psychological well being of family members of individuals with schizophrenia. *Social Psychiatry and Psychiatric Epidemiology* 2001;36:128-133
17. National mental health survey.<http://indiansnmhs.nimhans.ac.in/index.php>
18. "Mental Disorders". Medline Plus. U.S. National Library of Medicine. 15 September 2014; Archived from the Original on 8 May 2016. Available from: <https://medlineplus.gov/mental-disorders>.
19. Center for Psychiatric Rehabilitation What is Psychiatric Disability and Mental Illness? at the Wayback Machine. Boston University Retrieved; 2012.
20. Yesufu-Udechuku A, Harrison B, Mayo-Wilson E, Young N, Woodhams P, Shiers D, et al. Interventions to improve the experience of caring for people with severe mental illness: Systematic review and meta-analysis. *Br J Psychiatry* 2015;206:268-74.
21. Sin J, Norman I. Psychoeducational interventions for family members of people with schizophrenia: A mixed-method systematic review. *J Clin Psychiatry* 2013;74:1145-62.
22. Chien WT, Norman I. The effectiveness and active ingredients of mutual support groups for family caregivers of people with psychotic disorders: A literature review. *Int J Nurs Stud* 2009;46:1604-23.
23. Baruch E, Pistrang N, Barker C. Psychological interventions for caregivers of people with bipolar disorder: A systematic review and meta-analysis. *J Affect Disord* 2018;236:187-98.
24. Parija S, Yadav AK, Sreeraj VS, Patel AK, Yadav J. Burden and expressed emotion in caregivers of schizophrenia and bipolar affective disorder patients: A comparative study. *MAMC J Med Sci*. 2018;4:68-74.
25. Bora K, Das A. Family burden in caregivers of chronic schizophrenia and bipolar affective disorder – A comparative study. *J Med SciClin Res*. 2017;5:30237-47.
26. Solanki RK, Wasim M, Singh C. To study the burden and attitude of caregivers of schizophrenic patients. *Indian J Res*. 2017;6:473-5