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Original Research Article

A knowledge, attitude, and practice (KAP) survey of preeclampsia amongst specialists, junior residents and primary care providers (PCPs) in Mysore, India

Rohan Karkra[1], Hemapriya Lalchand[1*], Prathap Talwar[1]

[1]Dept. of Obstetrics and Gynaecology, JSS Medical College and Hospital, Mysore, Karnataka, India

Abstract

Background: Pre-eclampsia is a serious condition characterised by BP > 140/90 mmHg with signs of organ damage. It can lead to considerable morbidity and mortality and therefore needs to be identified early and treated promptly.
Aims and Objectives: To understand the gap in knowledge, attitude and practice among OBG specialists, junior residents and Primary care providers treating women with preeclampsia.
Materials and Methods: This was a questionnaire-based survey of OBG specialists, residents and Primary Care Providers using a set of 28 predetermined MCQ type questions.
Results: 45.4% of the respondents said the prevalence was 5-10% and 44% said morbidity was 5-15%. 68.1% identified Aspirin as the recommended drug for prophylaxis while 25.6% and 68.1% chose the dose of 81mg and 150mg respectively. 76.3% identified 140/90 mmHg as BP cut-off and 25.6% said proteinuria was not essential for diagnosis of pre-eclampsia. 93.2% of the respondents regularly screened patients for pre-eclampsia through history. 57.8% regularly prescribe anti-hypertensives. 78.3% consider pre-eclampsia a serious diagnosis and 62.8% prefer Paracetamol for analgesia.
Conclusion: This KAP study identifies the gaps in knowledge, attitudes and practices prevalent in Mysore, a tier two city in South India with respect to preeclampsia, and could serve as a starting point for education and empowerment of health workers in screening, diagnosis and management of preeclampsia.

Keywords: Preeclampsia, KAP, Survey, Questionairre, Magnesium sulphate.

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1. Introduction

Hypertensive disorders of pregnancy (HDOP) encompass multiple conditions, namely - Gestational hypertension, pre-eclampsia, eclampsia, and chronic hypertension, with each capable of drastically affecting the course of a pregnancy. Studies have estimated that hypertension complicates 10% of all pregnancies. In India, hypertensive disorders account for 18.35% of all maternal morbidity.[1] Internationally, hypertension is defined as having Systolic Blood pressure of more than 140 mmHg and/or a diastolic blood pressure of more than 90 mmHg. Mothers suffering from hypertension can develop severe complications including but not limited to – Nausea and vomiting, headache, abdominal pain, difficulty breathing, pre-term labor, placental disruption, pulmonary edema, cortical blindness, retinal detachment, HELLP syndrome, seizures, brain hemorrhage, even death. The fetus may suffer from intra-uterine growth restriction or intra-uterine demise.

A serious and distinct type of hypertensive disorder is pre-eclampsia. Studies have estimated a prevalence rate of about 4% in India.[1] Globally, 10-15% of maternal deaths are attributed to pre-eclampsia/eclampsia.[2] Pre-eclampsia is characterized by the presence of hypertension with signs of end-organ damage, typically in the form of edema or significant proteinuria which is defined as more than 300mg in 24 hours.[3] However, proteinuria is not an essential criterion for diagnosing pre-eclampsia.[4] Since pre-eclampsia indicates organ damage, it is understandable that it is a serious condition, and allowing it to progress can lead to dire complications. Patients with pre-eclampsia can progress to eclampsia which apart from the features of pre-eclampsia

*Corresponding author: Hemapriya Lalchand
Email: hemapriyakukreja@gmail.com

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involves having Generalised tonic clonic seizures (GTCS). This is a dangerous complication and this accounts for the majority of mortality among HDOPs.

Patients should be screened at each pre-natal visit by measuring their blood pressure and assessing risk factors. If found to be pre-eclamptic, patients should be managed with antihypertensives, adequate counselling, dietary modification, and advice about exercise. The American College of Obstetricians and Gynaecologists (ACOG) recommends 81 mg/day of Aspirin for prophylaxis of pre-eclampsia in high-risk and previously pre-eclamptic women.[5] WHO recommends 75mg for prophylaxis.[6] Other studies have even suggested higher doses, up to 150mg.[7] Anti-hypertensive medications are not mandatory until the blood pressure rises to significant levels (>160/100 mmHg) however, they may be started at lower BP levels too.[8] Nifedipine and Labetalol are the more commonly used anti-hypertensives. Patients who develop Eclampsia or have signs of impending Eclampsia should get $MgSO_4$. Delivery was considered as a cure, however, long term cardio vascular risks remain, and the woman should be offered long term follow up. Sometimes, there may even be new onset pre-eclampsia post-partum.[9]

Given the seriousness of this illness, and its relative ease of diagnosis, or at least detecting suspicion, all healthcare workers must be aware of the risk factors, signs and symptoms of pre-eclampsia so that they can institute early interventions or refer for higher Obstetric care. While OBG specialists are specially trained for dealing with this condition, a majority of the population in India will have their first contact with medical help through primary care providers and residents and therefore it is crucial to understand the current level of knowledge, attitude, and practices amongst these groups of health care professionals to identify gaps and address them systematically and educationally.

2. Materials and Methods

This was a questionnaire-based survey conducted amongst OBG specialists, OBG post graduate residents, and primary care providers in Mysore, a tier two city in South India. There were a total of 28 questions divided into 3 sections – Knowledge: 11, Attitude: 8, and Practices: 9. The questions were independently reviewed and validated by senior professors in the department of OBG, JSS Hospital. The questionnaire was made using google forms and shared with participants with the help of both online and offline means. Responses were obtained between 2/12/22 and 29/12/22. Some responses were obtained in pen and paper mode at a family physicians' meeting in the city. The participants were allowed to choose only 1 option out of the listed options. The responses were anonymized. no participants data was obtained. Responses were extracted into an MS Excel spreadsheet and analyzed. Ethical committee approval was obtained from the JSS Institutional Ethics Committee (JSSMC/IEC/011222/34NCT/2022-23).

3. Results

There were a total of 207 responses, of which 70 (33.8%) were OBG specialists, 35 (17%) were OBG post-graduate residents and 102 (49.2%) were primary care providers.

*3.1. Knowledge about pre-eclampsia (**Table 1**)*

3.1.1. Prevalence and morbidity

A majority of the respondents (45.4%) chose a prevalence of 5-10% which is the correct answer. The next most chosen option (35.7%) was 10-15%.

44% of the respondents chose morbidity of 5-15% (correct answer) and 31.4% chose 15-20%.

3.1.2. Prophylaxis

A majority of the respondents (68.1%) correctly identified Aspirin as the recommended drug for prophylaxis, and 31.9% chose the wrong option. The next most commonly picked option was Labetalol (26.6%). The p value obtained by applying the Fischer test was <0.001, which implied that a significant number of respondents had adequate knowledge about aspirin prophylaxis in prevention of pre-eclampsia.

A vast majority of the respondents (68.1%) chose 150mg as the recommended dose of Aspirin for prophylaxis. 25.6% chose the response – 81mg. This response was analysed only for those who chose Aspirin. 150 mg/ day was considered as the correct response, as in the Indian setting, we use 150 mg, as per the WHO recomendation. 81 mg is recommended by the ACOG.

3.1.3. Diagnosis

The majority of respondents (76.3%) correctly identified 140/90 mmHg BP as the cut-off for the diagnosis of pre-eclampsia.

However, only 23.7% correctly identified that proteinuria is not essential for the diagnosis of pre-eclampsia. (p <0.001) Only 14% of primary care providers correctly identified that Pre-Eclampsia does not necessarily require proteinuria. The majority of respondents (39.1%) (chi square 26.6) chose ‘Yes, 1+’ when asked if Proteinuria is essential.

A majority of the respondents (75.9%) correctly chose 20 weeks as the minimum period of gestation needed before diagnosing pre-eclampsia while 30% of Primary Care Providers chose the wrong option.

Table 1: Responses to some questions under the knowledge section

Question	OBG Specialists (n=70)	OBG PG Residents (n=35)	Primary Care Provider (n=102)	Overall (n=207)	P value
Prevalence					
0-5%	4	3	12	19 (9.2%)	0.45
5-10%	30	21	43	94 (45.4%)	
10-15%	28	9	37	74 (35.7%)	
15-20%	8	2	10	20 (9.7%)	
Morbidity					
0-5%	9	8	17	34 (16.4%)	0.48
5-15%	28	18	45	91 (44%)	
15-20%	25	8	32	65 (31.4%)	
20-25%	8	1	8	17 (8.2%)	
Recommended Prophylactic drug					
Folic Acid	1	0	9	10 (4.8%)	<0.001
Labetalol	7	8	40	55 (26.6%)	
Aspirin	62	26	53	141 (68.1%)	
Vitamin E	0	1	0	1 (0.5%)	
Dose of prophylactic drug					
150mg	55	22	64	141 (68.1%)	0.37
81mg	13	11	29	53 (25.6%)	
93mcg	1	1	6	8 (3.9%)	
117mg	1	1	3	5 (2.4%)	
BP Cutoff for diagnosis					
135/85 mmHg	4	2	9	15 (7.2%)	0.21
140/90 mmHg	57	27	74	158 (76.3%)	
139/99 mmHg	7	5	7	19 (9.2%)	
149/99 mmHg	2	1	12	15 (7.3%)	
Proteinuria needed for diagnosis?					
Yes, 1+	32	11	38	81 (39.1%)	<0.001
Yes, 2+	9	9	19	37 (17.9%)	
Yes, 3+	4	5	31	40 (19.3%)	
No	25	10	14	49 (23.7%)	
Can USG Doppler show signs predictive of severe Pre-Eclampsia?					
Yes	66	32	93	191 (92%)	0.74
No	4	3	9	16 (8%)	
Pre-Eclampsia can be diagnosed after?					
12 weeks	3	3	13	19 (9.2%)	0.23
20 weeks	60	28	69	157 (75.9%)	
24 weeks	4	4	13	21 (10%)	
28 weeks	3	0	7	10 (4.8%)	
Most common presenting complaint of HELLP syndrome					
Vomiting	17	12	28	57 (27.5%)	0.69
RUQ pain	36	13	45	94 (45.4%)	
Abortion/Bleeding	6	6	14	26 (12.6%)	
Petechial rash	11	4	15	30 (14.5%)	

Table 2: Responses to some questions under the attitude section

Question	OBG Specialists (n=70)	OBG PG Residents (n=35)	Primary Care Provider (n=102)	Overall (n=207)	P value
Patients should be immediately hospitalized					
Yes	26	11	47	84 (40.6%)	0.24
No	44	24	55	123 (59.4%)	
All patients should get antihypertensives					
Yes	57	23	77	157 (75.8%)	0.01
No	11	3	9	23 (11.1%)	
If impending Eclampsia	2	9	16	27 (13.1%)	
All patients should get seizure prophylaxis					
Yes	7	13	38	58 (28%)	<0.001
No	63	22	64	149 (72%)	
Pre-Eclampsia is a consequence of Gestational Hypertension					
Yes	18	9	39	66 (31.9%)	0.15
No	52	26	63	141 (68.1%)	
Smoking is the main risk factor					
Yes	35	11	43	89 (43%)	0.19
No	35	24	59	118 (57%)	
Pre-Eclampsia is a serious condition and requires prompt intervention					
Yes	54	32	76	162 (78.3%)	0.01
No	4	1	4	9 (4.3%)	
Sometimes	12	2	22	36 (17.4%)	
Bed rest can delay the onset					
Yes	17	6	37	60 (29%)	0.06
No	53	29	65	147 (71%)	
Delivery of baby cures Pre-Eclampsia					
Yes	63	20	84	167 (80.7%)	0.001
No	7	15	18	40 (19.3%)	

3.1.4. Complications

When asked if USG Doppler could correctly identify signs of severe Pre-Eclampsia, 92% of the respondents correctly answered yes.

45.4% of the respondents chose right upper quadrant pain as the most common presenting complaint of HELLP syndrome, followed by 27.5% who chose vomiting.

*3.2. Attitude about pre-eclampsia (**Table 2**)*

Should all patients be hospitalized?

59.4% of the respondents rightly said that all patients should not be hospitalized

Should all patients receive anti-hypertensives?

75.8% of the respondents said that patients should routinely get antihypertensive medications while 13.1% said that they should only get antihypertensives if there are signs of impending Eclampsia. The difference was statistically significant (chi square 13.2, $p < 0.01$).

Should all patients receive seizure prophylaxis?

72% of the respondents correctly said that patients should not get routine seizure prophylaxis, which was also significant statistically ($P<0.001$), implying that majority of the health care providers had the right attitude towards MgSO4 prophylaxis.

Is pre-eclampsia a consequence of Gestational Hypertension?

68.1% of the respondents said that pre-eclampsia is not a consequence of gestational hypertension, which was not significant statistically.

Is smoking a risk factor for pre-eclampsia?

57% of the respondents rightly said that smoking was not a risk factor for pre-eclampsia.

3.2.1. Pre-eclampsia is a serious diagnosis and requires prompt intervention

78.3% of the respondents correctly agreed with the statement while 17.4% said that it is true only sometimes. This difference is statistically significant, and implies that majority of doctors realise the importance of proper diagnosis and management of pre-eclampsia.

3.2.2. Bed rest delays pre-eclampsia

71% of the respondents did not agree with this statement.

Table 3: Responses to some questions under the practices section

Question	OBG Specialists (n=70)	OBG PG Residents (n=35)	Primary Care Provider (n=102)	Overall (n=207)	P value
Do you regularly screen patients for Pre-Eclampsia through history?					
Yes	61	34	98	193 (93.2%)	0.04
No	9	1	4	14 (6.8%)	
Do you routinely prescribe anti-hypertensives to patients with Pre-Eclampsia?					
Yes	38	17	65	120 (57.8%)	0.22
No	32	18	37	87 (42.2%)	
What is your target blood pressure when using anti-hypertensives?					
140/90 mmHg	38	10	26	74 (35.7%)	0.002
110/80 mmHg	5	3	21	29 (14%)	
135/85 mmHg	11	11	27	49 (23.7%)	
130/75 mmHg	16	11	28	55 (26.6%)	
Parameters for identifying Magnesium toxicity					
↓Patellar reflex & ↓ Respiration	60	25	68	153 (73.9%)	<0.001
↑ Patellar reflex & ↑ Diuresis	3	4	24	31 (15%)	
↑ Respiration & Oliguria	6	2	9	17 (8.2%)	
↓ Heart Rate & ↑ Diuresis	1	4	1	6 (2.9%)	
Preferred Analgesic					
Paracetamol	46	20	64	130 (62.8%)	0.29
Aceclofenac	6	9	20	35 (16.9%)	
Fentanyl	10	4	12	26 (12.6%)	
Morphine	8	2	6	16 (7.7%)	
For how long do you continue $MgSO_4$ post-partum?					
Stop at delivery	0	3	12	15 (7.2%)	<0.001
12 hours	4	6	22	32 (15.5%)	
24 hours	64	22	51	137 (66.2%)	
48 hours	2	4	17	23 (11.1%)	

3.2.3. Delivery cures pre-eclampsia

80.7% of the respondents agreed with the statement while only 57% of the post graduate residents agreed with the statement.

*3.3. Practices concerning pre-eclampsia (**Table 3**)*

93.2% of the respondents rightly said that they regularly screen patients for pre-eclampsia with the help of history while 6.8% did not. Surprisingly, 13% of the OBG specialists did not screen the patients. The difference is significant statistically.

57% of the respondents routinely prescribed anti-hypertensives to pre-eclamptic mothers which is not mandatory. Anti hypertensives are recomended only if DBP is peristently >100 mm Hg or SBP >150 mm Hg.

There was a correct consensus on target BP for a patient on anti-hypertensives with the most commonly chosen response being 140/90 mmHg (35.7%).

73.9% of the respondents correctly identified signs of Magnesium toxicity, which is statistically significant. It can be inferred that majority of the practitioners know and monitor for magnesium toxicity.

62.8% of the respondents said they preferred paracetamol for analgesia. The p value is not significant statistically, implying that different practitioners use different analgesic regimes.

66.2% of the respondents continue $MgSO_4$ for 24 hours postpartum, while 7.2% stopped immediately. This difference was statistically significant, implying that majority of the health care providers administer MgSO4 as per guidelines.

Zuspan (47%) and Pritchard (43%) were the most commonly used $MgSO_4$ regimens.

4. Discussion

Pre-eclampsia is a relatively common complication affecting hundreds of thousands of pregnancies globally.[1] It is

therefore imperative that health professionals are knowledgeable about this condition and are up-to-date on the recommendations and practices. In a study conducted by Stellenberg EL et al., 66.3% health care professionals had basic knowledge regarding HDP & 56.4% knew about the various risk factors of HDP.[18]

Pre-Eclampsia is defined as blood pressure above 140/90 mmHg with signs of end organ damage, detected for the first time after 20 weeks of gestation, in the form of edema, proteinuria, etc.[4] 76.3% of the respondents correctly identified this BP cut-off. It is, however, concerning that approximately 1 in 4 healthcare professionals do not know what constitutes pre-eclampsia. Ndirahisha E et al. observed that 85.7% of physicians, 83.3% of midwives and 65.3% of nurses were correctly able to define HDP.[19]

Only 23.7% said that proteinuria is not essential to the diagnosis of pre-eclampsia while 39.1% said that at least 1+ proteinuria should be present for diagnosis. While proteinuria was earlier considered necessary, it is no longer considered an essential criterion for diagnosis,[10] meaning 3/4th of the respondents were not aware of this change in definition. 75.9% of the respondents correctly identified 20 weeks as the minimum period of gestation required for diagnosis, but ¼ of the respondents did not choose the correct response.

45.4% of the respondents said the prevalence of pre-eclampsia was 5-10%. This is correct as reports published in the literature as well as official Indian government statistics have pegged the prevalence around 8%.[11] 44% of the respondents said that HDOP accounts for 5-15% of maternal morbidity. The actual morbidity is estimated to be around 18%.[1] The ACOG recommends that high-risk women receive 81 mg/day of Aspirin for prophylaxis against pre-eclampsia,[5] wheras the WHO recommends 150 mg/day, which is followed by majority of the Indian HCP's. Moreso, 1 in 4 postgraduate residents and nearly half of all primary care providers did not choose Aspirin, instead choosing Labetalol >>Folic Acid. This is concerning as many patients would likely benefit if the prophylaxis is instituted early and correctly. Our findings are similar to a study by Lavanya et al; wherein only 64.4% of nurses had satisfactory knowledge regarding prevention of preeclampsia, which was much lower than the resident doctors (87.7%). They observed that 63% of residents thought that using low doses of aspirin and calcium can prevent preeclampsia. Health care workers should be aware of the antihypertensive drugs, their indications, contraindications, dosage and limitations. 80.6% & 72.8% were using Labetalol as an antihypertensive drug of choice.[20]

92% of the respondents said that it is possible to identify signs of severe pre-eclampsia via USG doppler which is correct.[12] However, it must be understood that this investigation may not be within the reach of all patients in our country due to infrastructural and financial limitations.

45.4% of the respondents identified right upper quadrant (RUQ) pain as the most common presenting complaint of HELLP syndrome followed by 27.5% who said vomiting. This is consistent with medical literature.[13] In a study by Lavanya et al, the most common symptom of preeclampsia was reported as headache by 88.1% & nausea by 61.9% of the respondents.[20] This shows that there are significant gaps in the knowledge about pre-eclampsia, including the definition of pre-eclampsia. This needs to be addressed with utmost priority as a clinician cannot diagnose what he/she does not know. 40.6% of all respondents said that all patients should be admitted to the hospital. This is contrary to the consensus as patients can be managed at home unless there is severe hypertension or there are certain complications.[14] 11.1% of the respondents said that patients do not routinely require anti-hypertensives. This would be acceptable as many experts advocate using a conservative approach and reserving medication only for uncontrolled hypertension.[8] 28% of the respondents say that all patients with pre-eclampsia should get seizure prophylaxis. There is no rationale for this. $MgSO_4$ should be reserved for severe pre-eclampsia or eclampsia. Lavanya et al obsreved that 98.9% resident dctors & 96.6% nurses could accurately identify the need for MgSO4 and the correct doses in various regimens.[20] However, many doctors do not administer MgSO4 themselves, but rely on nurses to do so.

They also recorded that 79% of resident doctors and 69% nurses recomended bed rest as a treatment for preeclampsia.[20] In our study, 80.7% of the respondents said that delivery can cure pre-eclampsia however that is not necessary and postpartum pre-eclampsia is well documented.[9] 71% of the respondents said that bed rest cannot delay pre-eclampsia. There is no consensus however some studies have suggested that bed rest can help lower BP and delay pre-eclampsia.[15] However, it is not recommended to take prolonged bed rest. Only 1 in 4 respondents said that they target a BP of 135/85 mmHg with antihypertensives, which is recommended.[16] However, the remaining respondents gave different target values. 66.2% of the respondents said that they continue $MgSO_4$ postpartum for 24 hours. This is the currently accepted norm.[17] It is important to note that 7.2% of the respondents stopped $MgSO_4$ immediately after delivery which is not recommended. Sotunsa et al. also highlighted the importance of regular training programs to improve the knowledge and practices of HCW's.[21]

This study had some limitations. It was a questionnaire-based study with limited options, which may have limited the respondents' responses. For the sake of brevity, not all aspects of HDOP and pre-eclampsia could be assessed. It is possible that when faced with a question for which the respondent did not know the answer, they made a random guess instead of leaving the question blank. The sample size was also limited so it is likely not possible to extrapolate the results to a large population.

5. Conclusion

This KAP survey highlights the vast differences in the knowledge, attitudes, and practices among OBG specialists, residents, and primary care providers. For several questions, it can be seen that the responses are overwhelmingly incorrect which raises significant concerns, as pre-eclampsia is a serious condition that needs to be recognized early and treated promptly. There is a need for education and training for all healthcare workers to address this problem, as they are the first point of contact with the patient, and play an important role in decision making.

6. Source of Funding

None

7. Conflict of Interest

None.

8. Ethical

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