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COMPARISON OF SAFETY AND EFFICACY OF INTRAVENOUS LABETALOL VERSUS HYDRALAZINE FOR MANAGEMENT OF HYPERTENSION IN PREGNANCY AT NISHTER HOSPITAL MULTAN

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Abstract:
Background-*In pregnancy to control the severe hypertension situation, there is no record about the safety of intravenous labetalol and hydralazine. Labetalol and hydralazine both have their own disadvantage and advantages.*
Methodology- *In this method the comparison of the efficiency and safe reaction of labetalol and hydralazine was briefly examined in case of severe hypertension during pregnancy. 152 patients were selected and then these were subdivided into two groups. At start the blood pressure of all was noted then labetalol was given to one group and hydralazine was given to second group. After that the quantity of doses, side effect of both drug and the duration to meet the desired blood pressure was noted.*
Results- *After first dose of hydralazine 69.5% patient were able to achieve the desired blood pressure that is comparatively lower than those patients who were given labetalol as 81.5% of them were able to achieve the desired blood pressure. It was find out in this research that with the help of labetalol patient could achieve the desired blood pressure faster that hydralazine. The side effects of both drugs were completely examined.*
Conclusion- *Both drugs were proved very helpful in reducing the high blood pressure and getting the desired blood pressure conditions during pregnancy. It was also concluded in this study that labetalol is more efficient in reducing the blood pressure than the hydralazine. The side effects of hydralazine and labetalol is also comparable.*
Keywords: *Labetalol, Hydralazine, Severe hypertension in pregnancy.*

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INTRODUCTION:

During pregnancy days severe hypertension is one of the very common disorder in medical. This severe kind of hypertension disorder during the pregnancy affect almost 10-15% pregnancies, and in result it severely affect the maternal and neonatal and also mortality. Those women who perceive and then due to severe hypertension with diastolic C 110 mmHg or systolic blood pressure C 160 mmHg are at high risk of fetal complications. The very common reason of maternal deaths is the cerebral hemorrhage which arises due to the uncontrolled severe conditions of hypertension. These cases of mortality can be reduced by the proper treatment. It insists that proper treatment and management should be instituted and BP should be reduced to diastolic \ 110 mmHg and systolic \ 160 mmHg. There are a lot of studies on the meta analysis but none of them enlighten the drug or medicine that can be proved as very useful in case of hypertension during pregnancy. The aim of this study is to reduce the high blood pressure safely and no side effects of anti- hypertensive therapy. Three drugs are given orally to reduce the High Blood pressure during pregnancy those are Nifedipine, Labetalol and hydralazine and all of them have their own advantages and disadvantages. In this study comparison of efficacy and safety was examined in Labetalol versus Hydralazine to manage the hypertension in pregnancy. Hydrazine is used to activate potassium channel and due to the low quantity of potassium the contraction between veins is prevented. With span of activity going from 3 h to 8 h the beginning of activity is 10–20 min. When first dose is given with this crystalloid 500 ml is advised for the precautionary liquid administration as with IV Hydralazine hypotension can happen. With alpha-/beta-adrenergic rival Labetalol is a blended. For alpha 1 receptor, the alpha-blocking activity is particular whereas the activity of beta is nonspecific. With proper medication the activity of beta-blocking can be duplicate.

In myocardium by blocking adrenergic incitement of beta-1 receptors and alpha-1 receptors of vascular smooth muscles it lower the fundamental vascular obstruction without adjusting resting pulse, foundational blood vessel pulse, cardiovascular yield or stroke volume, evidently in light of its consolidated alpha-and beta-adrenergic movement. This is arranged under Pregnancy Category C of US FDA. The beginning of activity in the wake of arriving at blood is 5 min with term extending from 3 h to 6 h. 300mg is the most extreme IV portion.

MATERIAL AND METHOD:

This study was done in Jinnah hospital of Lahore. Those patients were selected in this study whose pregnancy age was 28 weeks having severe conditions of hypertension. Those who had any other disorder like asthma, heart problems, allergy to hydralazine and labetalol were not taken for this study. A written consent agreement were signed from all the women. In this method the comparison of the efficiency and safe reaction of labetalol and hydralazine was briefly examined in case of severe hypertension during pregnancy. 152 patients were selected and then these were subdivided into two groups. At start the blood pressure of all was noted and to record the diastolic and systolic pressure 5th and 1st korotkoff sounds was used respectively. After that labetalol was given to one group and hydralazine was given to second group. After that the quantity of doses, side effect of both drug and the duration to meet the desired blood pressure was noted.

By using the envelope method all the selected patients were allotted a schedule. By using the unopened envelope randomization was performed. The target blood pressure in case of diastolic was 90–100 mm Hg and 140–150 mm Hg in case of systolic. After the intake of first dose BP was thoroughly examined and second dose was given according to the requirement. If the first dose of drug didn't proved as much helpful in reducing the blood pressure then with the small amount that is 10mg of Nifedipine was given with second dose. All the doses were given in a controlled quantity.

Labetalol group: In this group, first of all 20mg of labetalol was given orally over 2min and after this BP was check after 10min if the BP was not less than the threshold then 40mg of labetalol was given over 2 min and after 10min BP was checked again if again BP was not less than threshold then 10mg of Nifedipine was added with 80 mg Labetalol and after that BP was again checked and if BP was still high than threshold then as per advice further medication were performed.

Hydralazine group: In this group, first of all 5mg of Hydralazine was given orally over 2min and after this BP was check after 20min if the BP was not less than the threshold then 10mg of Hydralazine was given over 2 min and after 20min BP was checked again if again BP was not less than threshold then 10mg of Nifedipine was added with 20 mg Hydralazine and after that BP was again checked and if BP was still high than threshold then as per advice further medication were performed. The heart rate was monitored after every 10 min during the treatment. Fetal heart rate was monitored using cardiotocography at every 30-min interval.

Data Collection:
In excel sheet all the data was entered related to the age of patients, their medical history, their pregnancy age, number of doses and outcomes, duration to achieve the desired BP these are primary outcomes. Secondary data was severity of hypertension, need of drug, delivery route, maternal complication for example vomiting, headache, abnormalities, complications in delivery, dizziness etc.

Statistical analysis:
For statistical analysis SPSS tool was used with version 16.0. In this study fisher exact test was used for the comparison of fetal outcomes.

RESULT:

After first dose of hydralazine 69.5% patient were able to achieve the desired blood pressure that is comparatively lower than those patients who were given labetalol as 81.5% of them were able to achieve the desired blood pressure. It was find out in this research that with the help of labetalol patient could achieve the desired blood pressure faster that hydralazine. The side effects of both hydralazine and labetalol drugs were completely examined. Stress, non-progression of labor, cardiotocography complications were the indications of LSCS. In hydralazine group mean systolic BP was 169.6 ± 11.71 and mean diastolic pressure was 105.6 ± 8.38 mm Hg as in table 1. In labetalol group 172.3 ± 12.6 was the mean systolic blood pressure and mead diastolic pressure was 104.6 ± 8.23 mm Hg.

Table 1. Mean systolic and diastolic pressure

Blood pressure in mm hg	Hydralazine group *n* = 76 (%)	Labetalol group *n* = 76 (%)	*P* value (unpaired *t* test)
Systolic blood pressure			
160–180	71 (93.4)	66 (86.8)	
181–200	4 (5.3)	9 (11.9)	
[201	1 (1.3)	1 (1.3)	
Mean ± SD	169.6 ± 11.7	172.3 ± 12.6	0.17
Diastolic blood pressure			
80–100	39 (51.3)	44 (57.8)	
101–110	29 (38.2)	23 (30.3)	
111–120	7 (9.2)	9 (11.9)	
[120	1 (1.3)	–	
Mean ± SD	105.6 ± 8.36	104.6 ± 8.23	0.45
Mean arterial pressure			
110–120	28 (36.8)	19 (25)	
121–130	28 (36.8)	43 (56.6)	
131–140	16 (21)	7 (9.2)	
[140	4 (5.4)	7 (9.2)	
Mean ± SD	126.94 ± 7.99	127.15 ± 8.15	0.8

Table 2. Number of doses

Number of doses	Hydralazine group *n* = 76 (%)	Labetalol group *n* = 76 (%)	*P* value (v^2 test)
1	53 (69.7)	62 (81.5)	0.04
2	23 (30.3)	12 (15.8)	
3	–	2 (2.7)	

Table 2. Shows that 69.7% of patients need only one dose of hydralazine to reduce the BP while 81.5% of patients need only one does of labetalol to reduce the BP and achieve the target BP that is comparatively higher than the hydralazine. Likewise only 15% of them require the second dose of labetalol to achieve the target BP and only 2% of them require third dose to get the threshold vale of BP. Whereas,30% of

patient require the second dose of hydralazine to achieve the target blood pressure and in this value of P was 0.04.

Table 3. Duration to achieve the target BP

Time in minutes	Hydralazine group n = 76 (%)	Labetalol group n = 76 (%)	P value (unpaired t test)
10	1 (1.3)	62 (81.5)	
20	52 (68.3)	12 (15.8)	
40	21 (27.7)	–	
50	2 (2.7)	2 (2.7)	
Mean ± SD (95% ci)	26.32 ± 9.78 (24.08–28.55)	12.63 ± 7.19 (10.99–14.27)	\0.0001

This Table 3. Shows the duration to achieve the desired BP in case of hydralazine and labetalol. By this table it is clear that with help of labetalol target BP can be achieve faster comparatively hydralazine.

DISCUSSION:

Previous studies describe that maternal hypotension is related to the hydralazine and less persistent high blood pressure comparatively to labetalol. More use of hydralazine have side effects like nausea, headache, flushing and tachycardia whereas that kind of side effects less likely to produce due to Labetalol. Form previous studies it was clear that labetalol is safer and efficient in reducing the BP during pregnancy having less side effects. Following table 4.shows that the incidence of adverse effect in both groups of Labetalol and hydralazine.

Table 4 Complication in maternal

	Hydralazine group n = 76 (%)	Labetalol group n = 76 (%)	P value (comparison of proportion)	Fisher's exact test
Headache	2 (2.7)	3 (3.9)	0.97	1 (NS)
Nausea	2 (2.7)	–		1 (NS)
Vomiting	–	2 (2.7)		0.49 (NS)
Visual disturbances	1 (1.3)	–		1 (NS)
Additional drug required	2 (2.7)	2 (2.7)		1 (NS)
Persistent hypertension	2 (2.7)	3 (3.9)	0.97	1 (NS)
Convulsion after drug administration	3 (3.9)	1 (1.3)	0.62	0.61 (NS)
Maternal hypotension	1 (1.3)	–		1 (NS)
Maternal tachycardia	–	1 (1.3)		1 (NS)

The recent studies describe that in reducing the hypertension during pregnancy both hydralazine and labetalol are equally efficient.

During pregnancy days severe hypertension is one of the very common disorder in medical. This severe kind of hypertension disorder during the pregnancy affect almost 10-15% pregnancies, and in result it severely affect the maternal and neonatal and also mortality. Those women who perceive and then due to severe hypertension with diastolic C 110 mmHg or systolic blood pressure C 160 mmHg are at high risk of fetal complications. The very common reason of maternal deaths is the cerebral hemorrhage which arises due to the uncontrolled severe conditions of hypertension. These cases of mortality can be reduced by the proper treatment. It insists that proper treatment and management should be instituted and BP should be reduced to diastolic \ 110 mmHg and systolic \ 160 mmHg. There are a lot of studies on the meta analysis but none of them enlighten the drug or medicine that can be proved as very useful in case of hypertension

during pregnancy. In an ongoing report by Sharma [4], 69 ladies got Hydralazine and 31 ladies got Labetalol during the investigation time frame. The occurrence of hypotension (C 30% reduction in systolic BP) was comparable between the Labetalol (10%) and hydralazine (11%). Another research done by Nombur et al. [8]. This randomized clinical preliminary for the treatment of extreme preeclampsia utilizing either Hydralazine or Labetalol showed that the two medications stay viable. In opposition to our investigation, an opportunity to accomplish control and the necessary number of portions were not statistically unique between the two gatherings. The distinction in the quantity of ladies in the two gatherings that had industrious hypertension was not measurably huge. There was no maternal hypotension in the two gatherings. Cerebral pain was significantly more continuous in patients given Hydralazine than following Labetalol use in this investigation. The thing that matters was measurably critical (25.4% versus 3.2%, separately, p = 0.01). There were no huge contrasts seen in fetal result between the two arms of study. A relative investigation of IV Labetalol and IV Hydralazine on mean blood vessel circulatory strain changes in pregnant ladies with hypertensive crisis by Swati et al. [9] indicated no huge distinction between the adjustments in the mean blood vessel circulatory strain in the wake of giving medications; concluding that both the medications were similarly compelling in the board of serious hypertension in pregnancy.

CONCLUSION:

Hydralazine and labetalol both were proved very useful in lower down the high blood pressure and getting the target blood pressure conditions during pregnancy. It was also concluded in this study that labetalol is more efficient in reducing the blood pressure than the hydralazine. The side effects of hydralazine and labetalol are also comparable.

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