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AETIOLOGICAL ROLE OF NITRIC OXIDE(NO) AND THERAPEUTIC ROLE OF NITRATES IN PREGNANCY INDUCED HYPERTENSION(P.I.H.).

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ABSTRACT

Aims and Objectives/Purpose of The Study: To find out nitric oxide –as an etiological indicator for it early detection and to judge its severity with subsequent nitrates therapy as very effective in treatment and prevention of complications in pregnancy induced hypertension (P.I.H.). **Methods and Matlerias:** Considering diagnostic criteria, inclusion and exclusion features, cases (n=50) and controls (n=50) selected on random basis. The blood levels of nitrates of both the groups are estimated clinically and following this, cases are treated by nitrates and the results are analyzed accordingly. **Results and Analysis:** The blood nitrates of cases reduced significantly and tested statistically by unpaired-t-test ($p=0.0027$) ($p<0.0001$). The nitrates therapy reduced BP (unpaired-t-test. $P=0.0125$ $p<0.0001$) and improved feto placental circulation. (unpaired-t-test UA $p=0.0003$, UTA $p=0.0982$ $p<0.0001$) Maternal outcome- Vaginal birth(52%) LUCS 40%, Discharge 8% without any complication and death. Neonatal outcome 2-2.5Kgs 19%, 2.5-3Kgs 66 %,> 3Kgs 15%, without any IUFD, stillborn, neonatal and preinatal death. **Conclusion:** Nitric oxide (NO) and its metabolites an etiological agent and nitrates have an prophylactic and therapeutic role in pregnancy induced hypertension (P.I.H). **Capsule:** Nitric Oxide (NO) and its metabolites measurement-aetioogical indicators-diagnosed early with severity –NITRATES as prophylactic and therapeutic-decreased M.M.R & I.M.R.

KEYWORDS: Nitric Oxide (NO) and its metabolites –aetiological factor-Nitrates-Pregnancy Induced Hypertension (P.I.H) –management**.**

INTRODUCTION/BACKGROUND OF STUDY

The hypertensive disorders complicating pregnancy are multiorgan system disease that develops as a direct result of gravid state which complicates 6-8% of pregnancies, causes maternal death in 15% and still remains as the most unsolved problem in obstetrics.

As there are many aetiological theories have been proposed, this study is directed to establish Nitric Oxide (Plamaer and Associates 1988) as an aetiological agent. Till to date most of treatment protocol are empirical and symptomatic. This study aims at early detection of the disease by Nitric Oxide (Nitric Oxide metabolite) and nitrates (Nitric Oxide donar) therapy proves not only much effective in the management but also in the prevention of complications with the continuation of pregnancy long enough to ensure a satisfactory outcome for the both and ultimately to decrease the Maternal Mortality Ratio (MMR) and Infant Mortality Rates (IMR).

METHODS AND MATERIALS

Considering diagnostic, inclusion and exclusion criteria, two groups (Cases and Control) (n=50) are selected on random basis.

Inclusion Criteria

Age (19-40) Yrs Primigravida: Multigravida (4:1) with POG>20weeks.(POG=Period of gestation).

Exclusion Criteria

1. Any medical, surgical gynaecological complications.
2. Abnormal placenta and cord.
3. BOH (Bad Obstetrics History).
4. Multiple pregnancies.

Diagnostic Criteria

(Mild and Severe-GANT AND ASSOCIATE 1973): BP≥140/90, Protenuria≥ 30mg/dl, creatinine ≥1.2mg/dl, Uric acid ≥5.5mg/dl.

The nitrates (Nitric Oxide metabolites) are measured chemically by nitrate reductase, (GRIESS) test in both

groups. The patients are treated by nitrates(Nitric oxide donors), doses and route of administration are as below.

GTN (Nitroglycerine) 5 or 10 mg patch, 1 patch (14=16 hrs), 10-200/ugm/min (0.2-0.3 mgm/kg/min with NS/5%D for maximum 24 hrs continuous infusion.

Isosorbide 5 mononitrate 20-40 mg PO action persists for 6-10 hrs.

Isosorbide dinitrate 5-10 mg SL action in 20-40 mins, 10-20 mg PO action in 2-3 hr.

RESULTS AN ANALYSIS

As Nitric Oxide is very unstable, its metabolite nitrates of both groups are estimated by nitrate reductase (Griess) test. Subsequently the results are analyzed and tested by unpaired-t-Test.($p=0.0027$,$p<0.0001$) The value is statistically significant and decreased nitrate levels in cases. The pretreatment and post treatment blood pressure recordings* analyzed and tested by unpaired-t-test (DBP $p=0.0125$, SBP $p<0.0001$) proved marked effective control of disease. The pre & post treatment colour Doppler study revealed (as per unpaired-t-test, UT.A-$p=0.0003$, and UT.A-$p=0.0982$) improvement of feto placental circulation and prevention of complications.

After consideration of severity and complications, nitrate therapy proved maternal outcome (VB52%, LUCS 40% Discharge with control 8%) and perinatal outcome (2-2.2 Kgs-19%, 2.5-3 Kgs 66%,>3kgs 15% with no IUFD still birth & perinatal death).

DISCUSSION

The NITRIC OXIDE(NO) previously known as Endothelial Derived Relaxing Factors(EDRF) (Palmer et al 1987), is a free radical gas (Moncoda and Higger 1998) with short half life(3-4Sec) synthesized from Arginine and causes Vascular smooth muscle relaxation.[1] It acts as a biological signal with paracrine mediator of local hormones[2] and functions through inhibitory and stimulatory pathway(Schroeder and Kho 1995 Monkoda and Higger 1993). Its withdrawal from the circulation leads to PIH. It maintains normal low pressure vasodilator state of fetoplacental circulation.[3,4,5] Lack of Nitric Oxide (NO)during gestation decreased its formation so its plasma level can be used as an indicator in the judgment of PIH and its severity.[6,7,8] The biological and pharmacological action of Nitrates due to Nitric Oxide (Moncoda and Higger 1993) which Cyclic GMP(Murad 1986, Molina 1987) mediated smooth muscle relaxation(Murad and Moncoda). It is very effective during increased hypertension and therapeutically if used have no adverse effects in either metabolic functions or CNS of the foetus. The isosorbide dinitrate and Nitroglycerine(GTN) have a definite role in placental blood flow and maternal blood pressure.[9,10,11]

CONCLUSIONS

1) Nitric oxide is proved as an aetiological agent.
2) Nitrates are very effective in the management.
3) Nitrates have a prophylactic role for prevention of complications.

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