BRINGING RICH, POWERFUL & HOT

GREETINGS .......

BELLARY
‘LOW DOSE’ regimens in ECLAMPSIA......

MAGNESIUM SULPHATE

12/12/2010
ECLAMPSIA

“Like A Flash Of Lightening”

Acute Convulsive Disorder

Hypertension .... Induced Or.... Aggravated .... by Pregnancy
Best Anticonvulsive

**MAGNESIUM SULPHATE**

is the drug of choice for routine anti-convulsant management of women with eclampsia, rather than diazepam or phenytoin.

Evidence from the Collaborative Eclampsia Trial.

DIFFERENT MgSO₄ REGIMENS ...

- Eastman.
- Pritchard.
- Chesley & Teppers.
- Hall, Anderson, Harbert.
- Flowers.
- Zuspan.
- Cruik Shant.
- Sibai.
- Sardesai
- Leens.

etc
Confusion to Clarity....

15 Years of MAGNESIUM SULPHATE

In

15 minutes
MgSO₄ Regimens...

VIMS classification

- **HIGH dose regimens**: Pritchard’s, Lucas etc.
  - loading dose > 10 gm

- **LOW dose regimens**: Zuspan, Suman, Sardesai etc.
  - loading dose < 10 gm

- **SINGLE DOSE Regimen**: VIMS Regimen

Joshi Suyajna D. ‘Hypertensive Disorders In Pregnancy’ - 2009
## Pritchard’s regimen

### Loading Dose

<table>
<thead>
<tr>
<th>Loading dose: 4g (20ml of 20%)</th>
<th>IV - over not less than 3 min followed by 5g (10ml of 50%) IM in each buttock. (10g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If convulsion persists over 15 min 2g (10ml of 20%) is given over 2 min.</td>
<td></td>
</tr>
</tbody>
</table>

### Maintenance

<table>
<thead>
<tr>
<th>Maintenance dose: 5g (10ml of 50%) is given every 4 hours &amp; alternate sites after assuring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Presence of knee reflex</td>
</tr>
<tr>
<td>2) Respiratory rate &gt; 14/min</td>
</tr>
<tr>
<td>3) Urine output 10</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Zuspan</td>
</tr>
<tr>
<td>Charles Flowers</td>
</tr>
<tr>
<td>Chesley -Tepper</td>
</tr>
<tr>
<td>Eastman</td>
</tr>
</tbody>
</table>
In 1997, Suman Sardesai from V.M. Medical College Sholapur presented the following:

<table>
<thead>
<tr>
<th>Loading dose</th>
<th>Maintenance dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>4g MgSO$_4$ given as IV or IM</td>
<td>2g given as IV/IM every 3hrs. If convulsions recurred after 15 min additional dose of MgSO$_4$ given</td>
</tr>
</tbody>
</table>
Pritchard Vs Zuspan

- Kathleen M Graham
- The Lancet, Volume 351, Issue 9108, Page 1061, 4 April 1998
- Magnesium sulphate in eclampsia
- Review of CET

"Examination of the Collaborative Eclampsia Trial, Sibai's work, and the research at the Parkland Memorial Hospital shows that Zuspan's regimen is eight times less effective than Pritchard's regimen in the prevention of convulsions in pre-eclampsia and eclampsia. Maternal mortality was 2.5 times greater in the women who received Zuspan's regimen than among those on Pritchard's regimen. 1

Zuspan's regimen should not be used for routine clinical use."

Which regimen to use .......??????
CONVENTIONAL WESTERN REGIMENS:

- cannot be given outside
- ‘obstetric care units’

- High dose
- Longer duration
- Cost in effective
- Trained Health prof
- Requires Ins. therapy
- More side effects
- Costant supervision

Conv. mgso4 regimen
GLIMPSES OF ....

ANTICONVULSANTS

1979 To 2010
30 years

VIMS- Hospital
Bellary
1978-1990  KRISHNA MENON’S REGIMEN

1990-1995  PRITCHARD’S OR K.M.REGIMEN

1995-1998  PRITCHARD’S …Dr. Shanthi

1998-2001  LOW DOSE –Dr. Veerendrakumar C.M.

2001-2003  SINGLE DOSE
Dr. Noorulameen

Meddling
With Magnesium Sulphate
by JOSHI SUYAJNA D
Professor of O.B.G.
VIMS, BELLARY
1979-1990  KRISHNA MENON’S REGIMEN
1990-1995  PRITCHARD’S OR K.M.REGIMEN
1995-1998  PRITCHARD’S
1998-2001  LOW DOSE
           or `PRITCHARD’S
2001-2004  SINGLE DOSE OR LOW DOSE  Study- 1
2004 onwards-  ‘SINGLE DOSE Magnesium Sulphate…’  Study- 2

SDM

12/12/2010
Pritchard’s Regimen....
54 years old!

Pritchard J.A.

“The use of the magnesium ion in the management of eclamptogenic toxemias.”

*Surg Gynecol Obstet.* 1955;
100: 131–140
PRITCHARD'S REGIMEN

1995-1998

ABANDONED AFTER LOADING DOSE

NO CONVULSIONS !!!
Need to reduce the dose...

AVERAGE WEIGHT OF INDIAN WOMAN IS LESS
Low-Dose Regimen...
Low... Dose... Steady Reduction in dose.... Indian Scenario...

SUB-OPTIMAL DOSE

MgSO4..... 2 gram IM
MgSO4..... 2 gram IV
MgSO4....... 2 gm. IM and 2 gm IM


“Disciplined use of MgSO4 is difficult to achieve in ‘resource poor settings’ of developing countries”
Delay in MgSO4 treatment - referred to tertiary hospitals with no or wrong-treatment

13.9% maternal deaths . admitted in moribund state...

Lopez and Llera
Early and ‘PROPER’ referral

is the cornerstone in the success of saving the mother in eclampsia.

Adetoro reported 14.4% of maternal mortality...referral without treatment...
SEARCH for a NEW MgSO4 regimen

1. Easy to monitor
2. Safe to follow in any setup - FRU

At the DOORS
SINGLE DOSE
MgSO₄

4 + 4

SUYAJNA JOSHI
1998
ONE Convulsion within 30 minutes

NO TREATMENT
MORE THAN ONE CONVULSION

WITHIN 30 MINUTES......

2 grams of IV MgSO$_4$
Convulsions after 30 minutes...

- 2 grams of IV MgSO₄

Can be repeated twice...
Switch on to ... 
Phenytoin Sodium 
regimen
IMPLICATIONS OF RESEARCH - Magpie Trial

Remaining question about Magnesium Sulphate

WHAT IS THE MINIMUM EFFECTIVE DOSE ?

THE LANCET-vol.359-june 1, 2002,psge-1888
Support...came after Magpie...

To make magnesium sulphate available to women at risk from eclampsia, a short regimen is suitable for use in underdeveloped countries – ideally this would include a single magnesium sulphate injection.

Andrew d weeks, Samuel Ononge

The Lancet, Volume 360, Page 1331, 26 October 2002
**1st study……2001 & 2002….**

**KSOGA - Mysore - 2004**

- 224 patients
- admitted in Eclampsia Labour Room -
- District Hospital, Bellary

<table>
<thead>
<tr>
<th>SINGLE DOSE</th>
<th>LOW DOSE</th>
<th>PRITCHARD’S</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>102</td>
<td>28</td>
</tr>
</tbody>
</table>
Prospective Observational study

Total of 513 cases of eclampsia studied

All patients received ‘single dose MgSO$_4$’
<table>
<thead>
<tr>
<th>Complication</th>
<th>No of women</th>
<th>Percentage (n=513)</th>
<th>Recurrence with single dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELLP syndrome</td>
<td>11</td>
<td>2.1%</td>
<td>1</td>
</tr>
<tr>
<td>Abruptio</td>
<td>10</td>
<td>1.94%</td>
<td>-</td>
</tr>
<tr>
<td>Cortical venous thrombosis</td>
<td>7</td>
<td>1.36%</td>
<td>2</td>
</tr>
<tr>
<td>Pulmonary edema</td>
<td>8</td>
<td>1.56%</td>
<td>-</td>
</tr>
<tr>
<td>Aspiration pneumonia</td>
<td>7</td>
<td>1.3%</td>
<td>1</td>
</tr>
<tr>
<td>Post partum hemorrhage</td>
<td>6</td>
<td>1.16%</td>
<td>3</td>
</tr>
<tr>
<td>Cortical blindness</td>
<td>3</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Acute renal failure</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe anemia</td>
<td>23</td>
<td>4.5%</td>
<td>2</td>
</tr>
</tbody>
</table>

Convulsion treatments
interval-
more than 6 hours
## Maternal deaths in eclampsia

<table>
<thead>
<tr>
<th>Cause</th>
<th>No of women (n=17)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intracranial hemorrhage</td>
<td>10</td>
<td>58.82%</td>
</tr>
<tr>
<td>Pulmonary edema</td>
<td>5</td>
<td>29.41%</td>
</tr>
<tr>
<td>Ante partum hemorrhage</td>
<td>1</td>
<td>5.88%</td>
</tr>
<tr>
<td>Acute renal failure</td>
<td>1</td>
<td>5.88%</td>
</tr>
</tbody>
</table>

**Convulsion-treatment interval**
The ‘convulsion-treatment’ interval.

MgSO₄ before referral and after reaching the referral centre- ......???????

87.5% of the patients did not receive any treatment before reaching the referral centre.

Treatment at the doorstep!
SEIZURE-FREE TRANSPORTATION

‘MgSO₄’ before referral
FOGSI PROJECTS

Bellary District

REACHING & SENSITISING ALL THE

24 X 7 MEDICAL OFFICER’S IN INDIA

UNDER

SAFE- MOTHERHOOD INITIATIVE

EMOC

12/12/2010
FOGSI PROJECTS

REACHING THE UNREACHED

Sanjay Gupte’s vision for FOGSI INITIATIVE 2010

Hospet... Koppal...Gangavathi..Shimogga...
Study 3....RCT
Single dose MgSO₄ (VIMS Regimen)
Pritchard regimen

168 Eclamptic women admitted to Dept of OBG, Vijayanagar Institute of Medical Sciences.

Single dose MgSo4 (group B- 88 patients)
Pritchard regimen (group A-80 patients)

July 2009 to June 2010

42 patients came with SDM given at FRU
Why Magnesium Sulphate ...?

1. To abort an attack of convulsion
2. To prevent immediate recurrence of convulsions
3. To gain time for the ANTIHYPERTENSIVE to act...

‘ONE ADEQUATE DOSE’ is sufficient
Maternal mortality vs MAP

<table>
<thead>
<tr>
<th>MATERNAL MORTALITY</th>
<th>MAP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE 1</td>
<td>120 to 130</td>
</tr>
<tr>
<td>CASE 2</td>
<td>&gt; 130</td>
</tr>
</tbody>
</table>

Study 3.....RCT
Single dose MgSo4 (VIMS Regimen) Vs Pritchard regimen
Study 3....RCT

Single dose MgSO4 (VIMS Regimen) Vs Pritchard regimen
Maternal complications vs MAP

- ABRUPTIO
- HELLP
- CEREBRAL
- CORTICAL BLINDNESS
- PULMONARY OEDEMA
- ARF

Graph showing the frequency of complications for different MAP ranges:
- <100 mmHg
- 100-120 mmHg
- >120 mmHg

Study 3: RCT
Single dose MgSo4 (VIMS Regimen) Vs Pritchard regimen
<table>
<thead>
<tr>
<th>Maternal death</th>
<th>VIMS regime</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>No</td>
<td>88</td>
<td>100</td>
<td>78</td>
<td>97.5</td>
</tr>
<tr>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>02</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>100</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

Comparison of maternal deaths between two groups
Fischer exact test
P – value – 0.22
VIMS Vs PRITCHARD’S 2010

Comparison of toxicity between two treatment groups

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>VIMS regime</th>
<th>Pritchard regime</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td>No</td>
<td>88</td>
<td>100</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>100</td>
<td>80</td>
</tr>
</tbody>
</table>

Comparison of toxicity between two groups
Fischer exact test  P-value = 0.00
What is the problem with PRITCHARD’S REGIMEN

1. Loading dose is **MORE** than necessary

2. Maintenance dose is **NOT** necessary
What is the problem with LOW DOSE REGIMEN... eg. ZUSPAN’s

1. Loading dose is NOT sufficient

2. Maintenance dose is NOT necessary
WHO is MORE important ....?

ANTICONVULSIVE

Antihypertensive