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IAP NEOCHAP

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EDITOR
DR. RHISHIKESH THAKRE

Bulletin of Neonatology Chapter of IAP

CHAIRPERSON'S MESSAGE

Dear friends,

Wish you all a Fantastic 2013.

I feel privileged to take over as Chairperson of the Neonatology Chapter of IAP. This organization has grown leaps and bounds in the last 5 years. Thanks to the hard work of all the members and the leadership during these formative years. Now is the time to consolidate and grow.

My report as secretary (2011-12) presented at the IAP Neocon held at Hyderabad in November 2012 summarises it. (It is also included in this bulletin). I have a good team of people to work with and would like to say that we will continue the good work the Chapter has been doing in improving the newborn healthcare, training and building a better Neonatal workforce in the country.

Strengthening the Fellowship program, releasing the Handbook, improving the newly created website and planning a Neonatal nursing program would me some of the aspects our team will be looking at achieving during the next two years.

I sincerely request you all to contribute and participate in this endeavor. Your feedback and support is vital.

IAP Best Chapter Award - 2012 IAP NEOCHAP

With warm regards,
Dr Ranjan Kumar Pejaver
FRCP, FRCPCH (UK), FIAP, FNNF.
Professor of Neonatology.

SECRETARY'S MESSAGE

Dear Fellow Academicians,

Seasons Greetings !

I feel happy that the first issue of the New Year of NEOCHAP is coming out. We ,the new team of office bearers have taken over. As Secretary I solicit the cooperation, encouragement and good wishes of all the readers and members of the Neonatal Chapter of IAP.

We intend to carry on the good work of our predecessors and start some new activities too. This newsletter will act as a medium to share these with you all. Please send in your suggestions to the Secretariat, we welcome them. Continuation and strengthening of the Fellowship program, conducting National Conference and zonal CMEs and bringing out some useful publications are our main goals.

We hope that we will live up to your expectations.

Yours in Academic Service,

Dr Rhishikesh Thakre
DM (Neo), MD, DNB, DCH, FCPS
Secretary, Neonatal Chapter of IAP
Professor, Div. of Neonatology

Report of the IAP Neonatology Chapter : 2011-12

Membership - Approaching the thousand mark

Fellowship Program : Flagship' activity of Neonatal Chapter.

To date,
Fellowship Centers : 40
Fellows registered to date : 148

Fellows passed exam : 81

- Annual Conferences: Regularly held since the last five years. 5th IAP Neocon held in November at Hyderabad. (Previous ones Mumbai, Bhubhaneshwar, Raipur and Ludhiana)
- From this year Zonal CMEs have been planned. First one was held at Dibrugarh in Febrauary.
- Every year at the PEDICON, a symposium on 'Neonatology/Perinatology ' is being organized by The Chapter. It has been very popular drawing a vast number of delegates.
- Neochap is the quarterly bulletin of the chapter brought out regularly. It is a scientific cum general newsletter.
- Research: The Chapter has embarked on planning multicentre trials in topics of Perinatology.

Ongoing projects are on optimum respiratory management of RDS; nutritional mangemant of LBW babies.

- Recognizing the need for a Perinatal Database in the country, The Chapter has started the task in earnestness initially involving Fellowship centres and some other interested Institutions. The aim is to expand it in due course.
- Publications: The Handbook of Neonatology is t ready. Contributions by various authors who are leaders in the field of Neonatology/Perinatology. The aim is to release it at the next Annual conference of the Chapter.
- Website: The Chapter has commissioned a website which will be a 'one site' informative and educative portal. Links to IAP and other related websites will be established.
- Supporting IAP activities related to newborns: Formulary: The Chapter has done the Neonatal section of the Formulary and followed it up with regular revision and updates.
- Designated days: May it be Breastfeeding week, Immunization related activities and so on, The Chapter has actively promoted them and held activities. IAP-FGM-NRP has had several members of The Chapter in important posts of organiazational structure. Joint National coordinators, zonal coordinators. State academic coordinators etc.

Unnatural selection and increasing antimicrobial resistance – meeting the challenge

IAP NEOCON Oration - 2012

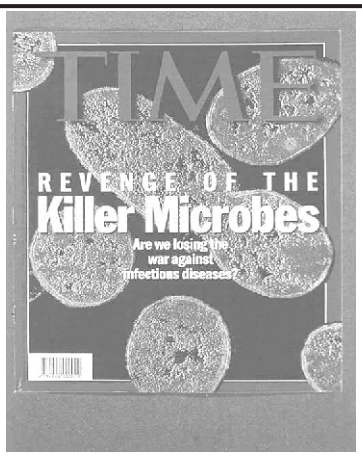
Dr. David Isaacs

Professor & Senior Staff Specialist

Paediatric Infectious Diseases, University of Sydney, Australia

The problem: antibiotic resistance

- Extended spectrum beta-lactamase (ESBL)
- Metallo-beta-lactamases (MBL) eg New Delhi
- VRE
- MRSA
- VISA etc.



Sensitivities of Gram negative organisms causing sepsis in Australia, 2002-6

Organism	C^SG^S	C^SG^R	C^RG^S	C^RG^R	Total
Escherichia coli	48	0	0	0	48
Klebsiella species	23	0	1	0	24
Pseudomonas sp.	8	1	0	0	9
Serratia sp.	2	0	6	1	9
Acinetobacter sp.	3	1	2	0	6
Other Gram negative bacilli	11	0	4	0	15
Total	**95 (86%)**	**2**	**13**	**1**	**111**

Neonatal infections in Asia, 2005

Tiskumara R, Fakharee SH, Lui C-Q, Numtnauimit P,Lui K-M, Hammoud M, Khan S, Lee JFK, Zuraidan SCO, Chow CB, Shek CC, Shenoi A, Nagesh NN, Halliday R, Isaacs D

Children's Hospital at Westmead, Westmead, NSW, Australia
Mofid Children's Hospital, Shariati Ave, Teheran, Iran
Children's Hospital of Hebei Province, China
Ramathibodi Hospital, Bangkok, Thailand
Centro Hospitalar Conde S. Januario, Macau SAR, China
Ab Sarah Maternity Hospital, Kuwait
Kuala Terengganu Hospital, Malaysia
Princess Margaret Hospital HKSAR, Hong Kong
Manipal Hospital, Bangalore, India
University of Sydney, Sydney, NSW, Australia

Sensitivities of Gram negative organisms causing late onset sepsis in Asia

Organism	C^SG^S	C^SG^R	C^RG^S	C^RG^R	Total
Acinetobacter species	6	2	7	3	18
Escherichia coli	13	1	5	4	23
Enterobacter species	11	2	12	3	28
Klebsiella species	34	2	1	13	50
Proteus species			2	1	3
Pseudomonas species	2		6	4	12
Serratia species	9		1	3	13
Other Gram negative bacilli	1		2	2	5
Total	**76 (50%)**	**7**	**36**	**33**	**152**

C=3rd generation cephalosporin (cefotaxime or ceftazidime for Pseudomonas)
G=gentamicin
^{S}=sensitive, ^{R}=resistant

Sensitivities of Gram negative bacillary infections Manipal Hospital, Bangalore, India, 2005

(with thanks to Dr. Arvind Shenoi and Dr. N. Karthk Nagesh)

	C^SG^S	C^SG^R	C^RG^S	C^RG^R
Klebsiella	1	0	1	18
Pseudomonas	1	1	0	2
Acinetobacter	0	2	0	0
E. Coli	1	0	0	1
TOTAL	3 (11%)	3	1	21 (75%)

India

- Klebsiella: causes early or late onset sepsis
- Staph aureus: usually causes late sepsis, but can be acquired from mother early
- Choice of antibiotics based on likely organisms
- Sensitivities: are maternally-acquired Klebsiella highly resistant or only hospital-acquired?

Kolkata 2008 (Raj Vishwanathan)

- 2165 live births
- Day 1-2 = 11 infections (5 per 1,000), 4 died
- Klebsiella 4; E coli 3; Acinetobacter 3
- All resistant to ampicillin, 8 to both cefotaxime + gentamicin
- ESBL causing early sepsis (community)

Kolkata 2008

- Days 3-7 inclusive
- 18 Gram negative infections, 4 died
- Kleb 8, E coli 5, Enterobacter 3, Acineto 2
- 13 resistant, 5 sensitive to cef + gent

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Kolkata 2008

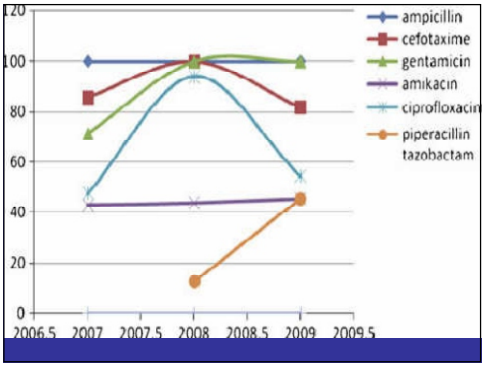
- Days 3-7 inclusive
- 18 Gram negative infections, 4 died
- Kleb 8, E coli 5, Enterobacter 3, Acineto 2
- 13 resistant, 5 sensitive to cef + gent

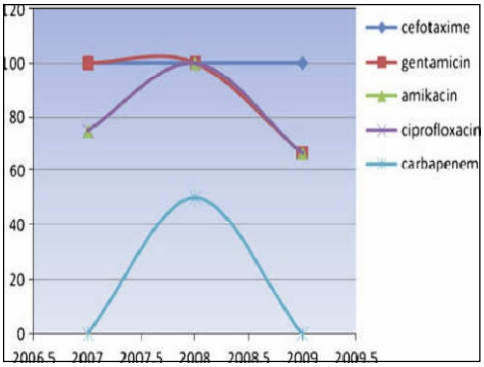
West Bengal, Kolkata, 2009

- 15 Gram negative infections aged 1-2 days
- Kleb 7; E coli 4; Stenotrophomonas 3
- 13 of them resistant to cef + gent
- 4 deaths

Next 2 slides

- Trends in antibiotic resistance in Kolkata
- Ist slide: Klebsiella
- 2nd slide: Acinetobacter





Empiric antibiotics

- In Kolkata:
- Piperacillin-tazobactam plus amikacin
- Both early onset and late onset sepsis

[ADCFN 2012; 97: F182-7]

New Delhi

- Infections with NDM-1 carrying strains
- New Delhi metallo-beta lactamase-1 (MBL)
- MBL are carbapenemases
- Resistance to meropenem + imipenem
- Spread to Pakistan and UK: medical tourism

The causes?

- Mutations go back millions of years
- Natural selection: Darwinian evolution
- Human activity: "unnatural selection"
- Reversible (by better antibiotic use)

Antibiotic resistance

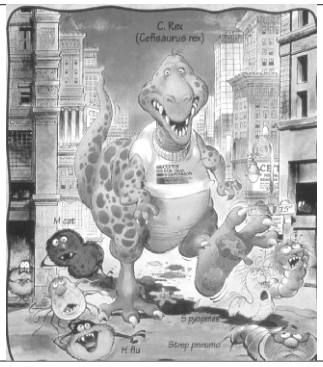
"State when the evolution of a microbe exceeds that of the prescribing physicians"

What are the causes?

- **Excessive hospital use of antibiotics**
- **Excessive community use of antibiotics**
- **Not just any old antibiotics**

The causes of antibiotic resistance

1) Overuse of broad spectrum antibiotics



Cross resistance driven by **broad spectrum** antibiotics: "Unnatural selection"

"Broad spectrum" equals cerebral disengagement

Which antibiotics drive resistance?

IV

3rd generation cephalosporins (cefotaxime)

Extended spectrum penicillins (ticarcillin-clavulanate, piperacillin-tazobactam)

Carbopenems (meropenem and imipenem)

Oral: quinolones (like ciprofloxacin)

Empiric Therapy

Empiric therapy: carefully considered, presumptive treatment of disease, prior to an established diagnosis

e.g. penicillin and gentamicin for presumed early neonatal sepsis

Spiralling Empiricism

[Dr James Peacock in Kim & Gallis, Am J Med 1989; 87: 201-6]

The unjustifiable escalation of treatment for suspected, but undocumented, infectious diseases

Spiralling empiricism in neonatology (from Neocon 2005)

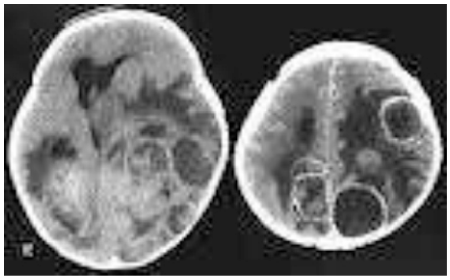
Full-term baby with perinatal asphyxia

Convulsion aged 2 days. "Too sick for LP"
- **Empiric penicillin and gentamicin**

Seizures continue, still sick
- **Vancomycin and ceftazidime added**

Still sick, raised CRP
- **Imipenem and amikacin added**
- **Ciprofloxacin added**

Day 14



Wrong babies

- **Giving antibiotics for colonisation without evidence of sepsis**

Private practice

- Only 20% of health care spending in India is in public sector
- Use of antibiotics without cultures
- Sale of IV antibiotics in pharmacies

Recommendation

Use narrowest spectrum antibiotics possible:

- Penicillin and gentamicin/amikacin
- Flucloxacillin and gentamicin/amikacin
- Vancomycin and gentamicin/amikacin

Not third generation cephalosporins

Not imipenem or carbapenem

Duration of antibiotics

Duration of antibiotics

- 26w, 850g, baby with possible early sepsis
- Penicillin + gentamicin from birth
- Baby stable at 3 days
- Blood and surface cultures negative
- CRP was 50, now 25
- Stop or continue antibiotics?

Reasons given for continuing antibiotics

- Baby looked sick
- Acute phase reactants elevated
- Cultures might be false negatives
- Cultures unreliable
- Culture results not back

No excuses

- Baby looked sick: other causes
- Acute phase reactants elevated: other causes so stop measuring them
- Cultures might be false negatives: 2-3 days enough when cultures negative
- Cultures unreliable: trust the lab
- Culture results not back: go and get them

Magical numbers

Duration of antibiotics

[Cotten CM et al. Pediatrics 2009; 123: 58-66]

- Retrospective study, 4039 babies <1000g
- Started early antibiotics, cultures negative
- Median duration of therapy 5 days
- OR of dying if 5+ days = 1.50 (1.11, 2.02)
- OR of NEC if 5+ days = 1.42 (1.13, 1.80)

Recommendation

- Use the shortest possible duration of antibiotics
- Stop after 2-3 days if cultures negative

Proven sepsis

- 7-10 days for septicaemia or pneumonia
- 2-3 weeks for menngitis
- Do not continue antibiotics for "probable sepsis" (culture negative) if baby not sick

War against resistance

- Escalation counter-productive
- Need to de-escalate
- Antimicrobial stewardship (Dr Jain)
- Government regulation

Good antibiotic practise

Use narrowest spectrum antibiotics possible

Treat sepsis, not colonisation

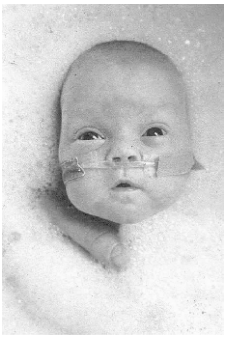
Stop antibiotics after 2-3 days if cultures negative

Do not continue antibiotics for spurious reasons

(e.g. baby looked sick, raised CRP)

Conclusions

- Antibiotic resistance is due to natural selection
- Resistant organisms are selected by antibiotic pressure:
  - broad spectrum antibiotics
  - long duration
- Can prevent resistance by better use of antibiotics
- Can reduce infections and prevent their spread by hand washing and early enteral feeds



GLIMPSES OF IAP NEOCON 2012 - HYDERABAD

GLIMPSES OF IAP NEOCON 2012 - HYDERABAD

Shock and Hypotension

Dr. Naveen Bajaj
DM (Neonatology), Neonatal-Perinatal Medicine Fellowship
Consultant Neonatologist, Deep Hospital, Ludhiana, Punjab.

Normal blood pressure is lower immediately after birth and increases progressively with postnatal age. Blood pressures are also normally lower in premature infants as compared to term infants and increase with increasing gestational age.

Definitions

Hypotension is defined as a "statistically low blood pressure" i.e. mean minus 2 SD at each postnatal and postmenstrual age reference range. Considerable variation exists among the reference ranges and this statistically low blood pressure may still be associated with normal systemic blood flow1. The most accepted criterion for diagnosing hypotension is that the mean arterial blood pressure in millimeters of mercury should be maintained at or greater than the mean gestational age in weeks (MAP in mm of Hg > Gestational age in weeks) as recommended by Joint Working Group of the British Association of Perinatal Medicine2. This rule of thumb applies mainly in first 24 – 48 hours of life and after this there is gradual increase in MAP so that most premature infants have MAP above 30 mm of Hg by 3rd day of life3. "Unsafe blood pressure" is defined as value lower than which there is a statistically increased risk for adverse outcome, but this does not necessarily mean that intervention at this value results in improved outcome. The ideal definition would be a threshold blood pressure lower than which intervention results in improved outcome i.e. “operational threshold”. This value would be patient specific depending on several factors, like gestation, birth weight, postnatal age, and the cause of the hypotension. Such a threshold which is ideal however, is currently remains elusive4.

Shock is a pathological state in which tissue oxygen delivery is inadequate to meet demand. Thus, the occurrence of shock depends on systemic blood flow, the oxygen content of the blood and oxygen demand. In a clinical situation, the balance between oxygen delivery and oxygen demand is difficult to assess. When systemic oxygen delivery decreases, there are several initial compensatory responses that occur to maintain perfusion and oxygen delivery to the most vital organs (brain, heart, lungs), including peripheral vasoconstriction, which maintains blood pressure. This is early compensated phase of shock i.e. shock without hypotension and is usually difficult to diagnose in neonates especially in more premature infants and commonly progress to uncompensated phase of shock. Progression to the uncompensated phase is characterized by signs of poor perfusion accompanied by low blood pressure i.e. shock with hypotension, ultimately leading to the irreversible stage if appropriate therapy is not instituted.

There is poor correlation between systemic blood flow and blood pressure in the preterm infant, extremely low systemic perfusion, shock, can occur with normal blood pressure. Conversely, preterm infants with blood pressure lower than average often have no biochemical or clinical signs of shock and have adequate tissue oxygen delivery. These preterm infants might not require treatment and labeled as having "permissive hypotension."

Diagnosis

Clinical Signs

Blood pressure : Mean Blood Pressure (in mm of Hg) should be higher than gestational age (in weeks) in first 48 hrs of life. By third day, mean pressure should be >30 mm of Hg in all preterm neonates (even in extreme preterms) and >45 mm of Hg in term neonates. Because of wide variation of blood pressure ranges at different gestation and postnatal ages, clinician should always look for the following other evidence of hypoperfusion also.

Capillary refill time (CRT): CRT < 3 sec is considered normal. Markedly increased CRT of > 4 sec is an indicator of low blood flow state.

Central –peripheral temp difference (CPTd): Cold extremeties and CPTd of > 20C indicate peripheral hypoperfusion.

Skin color: Dusky, mottled, pale or off color indicates peripheral vasoconstriction.

Heart rate: Clear increase in hear rate from previous stable baseline or persistent rising heart rate without any other obvious cause suggest circulatory compromise.

Urine output: Low urine output is important clinical indicator of circulatory compromise. Although the positive predictive value (PPV) of each of these individual parameters for identifying poor perfusion islikely to be low, it does seem that clinical assessment using a combination of signs helps to identify patients with poor outcomes5.

Serum Lactate Values

Limited data available on use of serum lactate values in hypotensive newborns. A worse outcome has been reported when lactate concentrations remained persistently elevated in sick ventilated newborns (23–40 weeks of gestation), mortality being 57% if two lactate values were greater than 5.6 mmol/L6. A combined lactate value of more than 4 mmol and prolonged capillary refill times of more than 4 seconds in the foot resulted in a PPV of 80% and a NPV of 88% for identifying low SVC flow, highlighting the value of combining clinical and biochemical parameters7.

Objective Assessment of Flow

Peripheral perfusion index (PPI): Can be readily measured in some pulse oximeter devices. It is a relative measure of the pulse strength and allows a continuous noninvasive estimate of peripheral perfusion. In neonates, a low PPI has been shown to correlate with illness severity and may be useful to detect left obstructive heart lesions in term newborns8,9, but needs further evaluation for its application in preterms.

Functional echocardiography (FE): FE is rational and noninvasive tool. It may play an important role in assessing the adequacy of circulatory status and providing useful hemodynamic information in almost any sick baby. It provides an objective assessment of cardiac function and output and also helps in assessment of response to therapeutic interventions. In preterm infant, circulatory shunting complicates the measurement of systemic blood flow, in comparison SVC flow provides a shunt-independent assessment of blood flow to the upper body. Low SVC blood flow has been associated with adverse short- and long term outcomes7, however, the PPV of low SVC flow measurement for adverse outcome is low, and therapy aimed at preventing low flow has not yet been

shown to be beneficial10. Although there is no good evidence that functional echocardiography improves neonatal outcome but it seems to have promising future.

Near-infrared spectroscopy (NIRS): Used to assess the adequacy of peripheral oxygenation and cerebral oxygenation. NIRS has yet to prove that its use improves outcome.

Intramucosal pH or PCO2: Using gastric tonometry, the intramucosal pH or PCO2 of the stomach can be calculated and used as an index of local perfusion. Because splanchnic blood flow decreases early during compensated shock states, it can be used as an index of adequate overall oxygen delivery. But in neonates, no significant association between intramucosal pH and death has been found and its role is yet to be evaluated.

Treatment Strategies

Volume expansion/Fluid boluses

Fluid boluses are the usual first intervention in neonates with low blood pressure. Neither there is physiologic rationale nor any reliable evidence to support its use, as most hypotensive neonates have normal circulating blood volumes. Observational studies have shown a short term improvement in systemic blood flow after volume expansion11. Considering that accurate diagnosis of absolute or relative hypovolemia is difficult in neonates and hypovolemia reduce the efficacy of inotropes, it seems reasonable to initially treat hypotension with 10-20 ml/kg of NS over 30-60 min. However, there is an association between excess fluid administration and increase in the incidence of IVH, PDA, BPD, and adverse neurologic outcome. Moreover, multiple fluid boluses has also been associated with increased mortality in the preterm infant. Hence, repeat fluid boluses and excess fluid intake should be avoided and if normalization of blood pressure is not achieved with single fluid bolus then initiation of inotrope should be the next step.

Inotropes/Vasopressors

Dopamine

Most commonly used sympathomimetic amine for treatment of hypotension. It stimulates the α and ß adrenergic and dopaminergic receptors in dose dependent manner. At lower doses, it acts by increasing myocardial contractility but at higher doses peripheral vasoconstriction and increased afterload play increasing role in its effect on blood pressure. There is significant degree of variability in response to dopamine dose between individual neonates. Dopamine usually is initiated at dose of 5 µg/kg/min and increased to 20 µg/kg/min according to the response of the blood pressure. There is concern of excessive peripheral vasoconstriction in dose of > 20 µg/kg/min, although there is little evidence of harm with higher dose if hypotension is by vasodilation.

Dobutamine

It is inotropic sympathomimetic amine having complex cardiovascular actions by various degree of actions at both α and ß receptors. It increases myocardial contractility by myocardial adrenergic receptors and cause variable peripheral vasodilatory effect via stimulation of peripheral cardiovascular α adrenergic receptors. In contrast to dopamine it does not rely on release of endogenous catecholamines for positive inotropic action. Dobutamine is particularly suited to treatment of hypotension in neonates with associated myocardial dysfunction and low cardiac output. Dose of 5 µg/kg/min increases left ventricular performance and doses of 10-20 µg/kg/min increases cardiac output and systemic blood flow.

Epinephrine

It stimulates α1, α 2, ß1 and ß 2 receptors and causes vasodilation at low doses, ionotropic action that appear to increase as the dose increases, and begins to cause significant vasoconstriction at high doses. Thus, epinephrine at low doses will probably increase cardiac output and at moderate doses will likely increase blood pressure as well. The dose range in neonate is 0.05-2.6 µg/kg/min. Epinephrine is usually used in treatment of refractory hypotension.

Norepinephrine

Not been studied much in neonates. Because of its lower affinity for the ß2 receptor, Norephinephrine is more likely to cause vasoconstriction compared to epinephrine. Since vasodilated septic shock is not commonly seen in the newborn, norepinephrine probably has a limited role in treatment of neonatal hypotension.

Milrinone

It is a phosphodiesterase inhibitor and therefore increases intracellular cAMP causing inotropic effect and vasodilatation. No evidence of benefit has been found by using milrinone for prevention of low systemic blood flow in sick very preterm neonates.

Glucocorticoids

Reversal of adrenergic receptor downregulation and relative adrenal insufficiency especially in preterm infants explain the corticosteroid responsiveness of vasopressor resistant hypotension. Hydrocortisone in doses of 2-10 mg/kg/day can be used selectively in case of vasopressor resistance hypotension but with caution considering its side effects.

Dopamine vs Dobutamine

Cochrane meta- analysis12 concluded that dopamine is more effective than dobutamine in the short term treatment of systemic hypotension in preterm infants. No evidence of significant effect in any medium to long term outcome and difference in the incidence of tachycardia between the two agents has been found. Dobutamine is better at increasing left ventricular output whereas dopamine produces greater increase in blood pressure and systemic vascular resisitence13. Another study demonstrated that dobutamine is better than dopamine at increasing SVC flow in preterm infants with low SVC flow in first postnatal day14.

Dopamine vs Epinephrine

Similar treatment success rates from use of dopamine and epinephrine in hypotensive preterm infants in first postnatal day has been reported15.

When to intervene?

Hypotension without shock

Need for treatment of infants who are hypotensive, but have adequate tissue oxygen delivery remains unclear. Preterm infants with numerically low blood pressure are routinely treated in may units by one or several fluid boluses followed by inotropes and then glucocorticoids. There is no reliable evidence that treatment of low blood pressure alone decreases brain injury or improves any other clinically important outcome16. Furthermore, the

infants in Canadian Neonatal Network database17 who had treatment with pressors, despite a blood pressure that was never hypotensive (BP below their gestational age, or below the 10th percentile) had a higher frequency of severe IVH than hypotensive infants who were not treated. Whether, it is the treatment of hypotension or the hypotension itself is harmful remains uncertain ?

Shock without hypotension

Shock can occur without hypotension, as when cardiac output reduces, peripheral vasoconstriction maintain blood pressure to a certain extent. However, if cardiac output falls further, hypotension ensues. For neonates who are shocked but normotensive, therapy should be directed to increase cardiac output while attempting to decrease systemic and pulmonary vascular resistance suggesting a preference for dobutamine, with low-dose epinephrine being a reasonable alternative. In neonates having PPHN during this phase of shock decreasing pulmonary vascular resistance with inhaled nitric oxide may improve right ventricular function, and help in treatment of shock, even when the neonate is not hypoxic. If sepsis is likely, fluid boluses can be considered after institution of inotropes.

Hypotension with shock

Infants who are both hypotensive and in shock have very high morbidity and mortality. Pathophysiologically appropriate therapy should be directed at increasing systemic perfusion, while attempting to avoid the adverse effects of increased afterload on myocardial function. Epinephrine may be the optimal drug but close monitoring of cardiac function and blood flows helps in determining the appropriate manipulations of inotropic agents like dopamine, dobutamine and epinephrine. Direct measurements of systemic blood flow may aid rational treatment ensuring that increases in therapy actually improve flows. Fluid boluses and glucocorticoids may be considered, especially if sepsis is likely.

Therapeutic end points

Suggested goal of therapy in term neonates are CRT<2 sec, normal pulses without differential between peripheral and central pulses, warm extremities, urine output > 1 ml/kg/hour, low lactate and mixed venous saturation > 70%18. The therapeutic end points for preterm are not established but the above goals seems reasonable.

Appendix

Calculation of Inotrope dose

1) $\frac{6 \text{ X desired dose (ug/kg/min.) X weight (kg)}}{\text{Desired rate (ml/hr)}} = \text{mg drug/100 ml fluid.}$

2) Add 1 mg/kg of Dopamine in 6 hrs drip which given dopamine at rate of 2.7 µg/kg/min.

3) For bedside calculation = 6 X wt. = mg of drug dissolved in 10 ml

(0.5 ml /hr = 5 ug/kg/min)

References

1. Kluckow M, Evans N. Low systemic blood flow in the preterm infant. Semin Neonatol 2001;6:75-84.
2. Report of Working Group of the British Association of Perinatal Medicine and Neonatal Nurses Association on categories of babies requiring neonatal care. Arch Dis Child 1992;67(7 Spec No):868–9.
3. Hegyi T, Carbone MT, Anwar M et al. Blood pressure ranges in premature infants in the first hours of life. J Pediatr 1994;124:627-633.
4. Dempsey EM, Barrington KJ. Evaluation and treatment of hypotension in the preterm infant. Clin perinatol 2006;36:75-85.
5. Dempsey EM, Al-Hazzani F, Barrington KJ, et al. Permissive hypotension in the ELBW. Pediatric Academic Societies Annual Meeting 2005, abstract 560. Washington DC, May 14–17, 2005.
6. Deshpande SA, Platt MP. Association between blood lactate and acid-base status and mortality in ventilated babies. Arch Dis Child Fetal Neonatal Ed 1997;76(1):F15–20.
7. Miletin J,DempseyEM. Lowsuperior vena cava flow on day one and adverse outcome in the very low birth weight infant. Arch Dis Child Fetal Neonatal Ed 2008;F368–71.
8. De Felice C, Latini G, Vacca P, et al. The pulse oximeter perfusion index as a predictor for high illness severity in neonates. Eur J Pediatr 2002;161(10):561–2.
9. Granelli AW, Ostman-Smith I. Noninvasive peripheral perfusion index as a possible tool for screening for critical left heart obstruction. Acta Paediatr 2007;96(10):1455-9.
10. Barrington KJ, Dempsey EM. Cardiovascular support in the preterm: treatments in search of indications. J Pediatr 2006;148(3):289–91.
11. Osborn DA, Evans N, Kluckow M. Clinical detection of low upper body blood flow in very premature infants using blood pressure, capillary refill time and central-peripheral temperature difference. Arch Dis Child, fetal Neonatal Ed 2004;89:F168-F173.
12. Subhedar NV, Shaw NJ. Dopamine versus dobutamine for hypotensive preterm infants. Cochrane Database Syst Rev 2003;(3):CD001242.
13. Roze JC, Tohier C et al. Response to dopamine and dobutamine in hypotensive very preterm infant. Arch Dis Child 1993;69:59-63.
14. Osborn D, Evans N, Kluckow M. Left ventricular contractility in extremely premature infants in first day and response to inotropes. Pediatr Res 2007;61:335-340.
15. Valverde E, Pellicer A, Madero R et al. Dopamine vs epinephrine for cardiovascular support in LBW infants: analysis of systemic effects and neonatal clinical outcomes. Pediatrics 2006;117:e 1213- e 1222.
16. Dempsey EM, Barrington KJ. Treating hypotension in the preterm infant: when and with what: a critical and systematic review. J Perinatol 2007;27:469e78.
17. Synnes AR, Chien LY, Peliowski A, Baboolal R, Lee SK. Variations in intraventricular hemorrhage incidence rates among Canadian neonatal intensive care units. J Pediatr 2001;138:525e31.
18. Parker MM, Hazelzet JA, Carcillo JA. Pediatric considerations. Crit Care Med 2004;32(Suppl 11):S591-4.

Report of IAP NEOCON 2012, HYDERABAD

Dr. Srinivas Murki - Organizing Secretary

It is a pleasure to be on this stage as the Organizing secretary of IAP Neocon 2012, the fifth National Conference of neonatal chapter of IAP and AP Neocon, a yearly conference of AP state NNF. We the organizing team put in our best to make this event a conference with a difference.

We choose our theme "infection control and Optimize Antibiotic Usage" as this is the crux of quality newborn care. Infections contribute to nearly 50% of neonatal deaths and misuse of antibiotics result in rising incidence of drug resistant bacteria such as ESBL and MRSA. We have with us Dr. David Isaacs, an expert on infection control and appropriate antibiotic usage to address these important issues. We hope the contents of this conference, (workshop on this theme, release of book, panel discussion) help us all to improve the neonatal survival and also optimize the use of antibiotics.

This is the first time IAP and NNF have joined hands to organize a combine event. I thank the officer bearers of IAP neochap and AP state NNF for making this happen.

We made every effort to keep a link with our Delegates. We sent nearly 25 messages, one every week to spread knowledge and awareness on newborn care. Today we have 500 delegates registered for our conference.

For the CME we tried our best to tailor the talks to the needs of postgraduates, practitioners, fellows and DNB neonatology students, and also for core neonatologist. We choose the topics first and then the faculty to give a true academic flavour to our conference. Our faculty is truly the best in the country and in the field of their talk. To facilitate delegate interaction and to summarize the sessions, we choose to have expert moderators.

We received 25 papers for poster, paper presentation. We got the manuscripts submitted for oral presentation peer reviewed by 3 reviewers and selected the best 3 of them. For the first time we introduced a cash price of Rs.10000 for best paper and Rs.5000 for best poster

No conference is complete and successful without the contribution from Sponsors. Our special thanks to our prime sponsors i.e Zeal medicals, Sun pharma, Fisher and Paykel, Sandor , GE, Suvanta and Phoenix). We also thank all the sponsors for their contribution.

In the last, as you all know, organizing a conference is a team work. I am fortunate to work under the leadership of Dr.Pramod, who is an inspiration to be a true team leader. At every step of the conference Dr. Pramod was behind to guide and to act. I also anknowledge the contribution all the other members of organizing team and on note our Chairman Dr.IS Rao and Reception committee chairperson Dr.Jadgish Chandra. However my special thanks for some people who worked relentlessly to make this event a success. Dr.Nuzhat, Head of Obstetrics at Fernandez Hospital was instrumental in giving a decent look to the brochure, to the backdrops and also guiding us to organize the event meticulously. Ms.Beula, Ms.Ruth, Col.Sabarwal and many other members of Fernnandez family were and are always there to give a team spirit to this event.

I thank Dr.Anjali, Dr.Ranjan, Dr.Sailesh, Dr. Sanjay and my friend Dr.Rishi for giving us this opportunity and also for guiding us at every step to organize this mega event.

Thank you one and all

■■■

BEST IAP NEOCON PAPER - 2012

Insure therapy in babies with respiratory distress syndrome
An Indian Experience

Bonny J, Ruchi N, N.S.Kabra - Department of Neonatology, KEM Hospital, Mumbai.

Background : The INSURE (Intubation-surfactant-extubation) method has been found to reduce the need for MV, the duration of respiratory support, and the need for surfactant in preterm infants with respiratory distress syndrome (RDS). Very little evidence from india is available that supports or disproves the role of INSURE(Intubate, Surfactant administration and Extubation to CPAP) therapy in babies with RDS.

Objective and Design: In this study, we evaluated the effect of INSURE therapy in babies with respiratory distress syndrome. The study was conducted from August 2010 to August 2012.

Setting : Tertiary care neonatal unit in western India.

Subjects and interventions:

All infants < 37 weeks' gestation with signs of RDS (oxygen requirement > 30% within 6hrs of life, respiratory distress requiring CPAP, and consistent chest radiograph). The components included CPAP(SAS >=3 and/or FiO2 >30 %) irrespective of ABG, surfactant therapy in a baby with RDS (Ind : FiO2 > 40% for > 1 hr to achieve ABG PaO2 of 50-70mm Hg and SaO2 of 88-92% and planned extubation within 30 min after surfactant administration.

Outcome measures:

Primary Success or failure of INSURE therapy. Failure of INSURE included death or up gradation to mechanical ventilation

Secondary Duration of non invasive ventialtion, complications, duration of hospital stay.

Results: One hundred and sixteen babies with RDS who satisfied the inclusion criteria were enrolled in the study over course of two years. 88(75.86%) babies had success on insure therapy. Predictors of success with INSURE therapy were birth weight >1500g(88.57%), gestational age >32weeks(92.68%), adequate coverage of antenatal steroids(85%), lower grade of RDS(grade 1 and 2), initiation of CPAP within 3 hrs of birth(85.71%), surfactant administration within 3 hrs of birth(100%). Predictors of failure included birth weight<750g (75%), gestational age 26-28wks(64.3%), non administration of antenatal steroids(48.1%), resuscitation>5 min(75%), higher grade of RDS viz grade 3 and 4, multiple doses of surfactant(73.33%), delayed initiation of CPAP>9 hrs (44.8%) and administration of surfactant>9hrs(38.2%). There was significant association between birth weight(p value 0.003), gestational age(p value 0.001), antenatal steroids(p value 0.02), lower grades of RDS(p value 0.003), initiation of CPAP(p value 0.019), administration of surfactant(p value 0.004) and outcome of INSURE therapy. Majority of the babies(62%) had no complications. 18 babies(15.5%) of those who had failed CPAP died whereas 6 babies(5.1%) had mod to severe neurologic deficit.

Conclusion: INSURE therapy for RDS in preterm babies is effective, safe and can circumvent the need for mechanical ventilation and its antecedent complications. ■■■

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