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SANGYAHARAN SHODH

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EDITORIAL

Integrated Medical Education

Integration of Ayurvedic system with modern medicine is our Global Commitment and we have to go along with Open mind. The aim of all medical system is only one-to provide good health to all human being without any discrimination .The differences and Pathy biases have to be removed. Now a Global regulatory body (Neutral) is needed to regulate all the systems in the world.

I hope that the august gathering of Anesthesiologist of Indian Medicine will meet at Pune on 5-7th February during the 14th National conference and will certainly discuss the possibility and the fate of integration.

I know very well that it is not a very easy task but in long term world will realize the importance of integration of Ayurved with other system of medicine. In the western medicine also many learned persons are working on this line and I am sure that all these efforts will be successful.

It is indeed a great pleasure to inform that 2 Years P.G.Diploma Course in Sangyaharan is recognized by C.C.I.M. Now the colleges which are conducting P.G. in Shalya will be able to start P.G. Diploma in Sangyaharan and Vikiran. It is a step towards integration.

Jai Hind **Jai Ayurved** **Jai Sangyaharan**

Devendra Nath Pande

Chief Editor

Evaluation of the efficacy of Jatamansi Ghan Satva in comparison to Diazepam on the emergence reactions of Ketamine Anaesthesia in female patients

Prof. H. K. Kushwah** * Dr. Ashok Kumar** ***** Dr. Narinder Singh**

ABSTRACT

Clinical trial of Jatamansi Ghan Satva as a premedicant is conducted on 30 female patients undergoing various surgical procedures under Ketamine anaesthesia. An effort has been made during this study to clinically analyze the efficacy of Jatamansi Ghan Satva as pre-medication agent in comparison to the diazepam.

It is found that both Jatamansi Ghan Satva & diazepam were not able to fully control the cardiovascular stimulations along with visual & auditory hallucinations, terrifying delirium during induction and vivid (pleasant or unpleasant) dreams, purpose less movements, psychotic behavior during emergence, but the patients in whom the Jatamansi Ghan Satva was administrated continuously for seven days as pre-medication showed better control over these adverse reactions. The incidences of pre-procedure & post-procedure amnesia are significantly less in the Jatamansi Ghan Satva pre-medicated group.

Key Words: Dissociative anesthesia, nystagmus, amnesia, hallucination.

Introduction

Ketamine produces a most useful state of dissociative anaesthesia .The patient rapidly goes in to a trance like state, with widely open eyes & nystagmus before proceeding towards unconsciousness, amnesia & deep analgesia. Although it is a marvelous drug that

has made many operations possible that would otherwise have been impossible for lack of a trained anesthetist & adequate equipment.

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Ketamine also has a few disadvantages as it produces frightening hallucinations, terrifying delirium, vivid (pleasant or unpleasant) dreams, purpose less movements, psychotic behavior during induction & emergence. These emergence reactions are common in young adults recovering from Ketamine anaesthesia, but are much less common in children & in very old patients. Several drugs, including haloperidole, can usually prevent these emergence reactions, but Promethazine or Diazepam are the best. Although these drugs often referred to as “premedication”, specifically to counter the undesirable emergence reactions. Keeping in to consideration the therapeutic effects of Jatamansi Ghan Satva , it is compared in two therapeutic doses (**Group A** Single dose of Jatamansi Ghan Satva10mg/ kg body weight with a sip of water approx. 2 hours prior to induction & **Group B** Jatamansi Ghan Satva 5mg/ kg body weight twice daily for continuously for 7 days prior to surgery ,along with the similar dose approx. 2 hours prior to induction.) with **Group C** (Standard group) diazepam 0.2 mg/kg body weight which is administered 1-3 min. prior to induction through I.V route.

Materials & Methods

After thorough pre-anesthetic assessment including complete examination & routine investigations 30 female patients of age group 20-45 years posted for short surgical procedures under Ketamine I.V bolus dose of 2mg/kg body weight & not having any type of cardiovascular, respiratory or psychiatric illness are selected for the trial. These Are Randomly divided in three groups:

A. **Group A** Single dose of Jatamansi Ghan Satva10mg/ kg body weight with a sip of water orally approx. 2 hours prior to induction as premedication.

B. **Group B** Jatamansi Ghan Satva 5mg/ kg body weight twice daily for continuously for 7 days orally prior to surgery , along with the similar dose approx. 2 hours prior to induction as premedication.
C. **Group C** (Standard group) diazepam 0.2 mg/kg body weight which is administered 1-3 min. prior to induction through I.V route.

Before shifting to the OT thorough examination along with the proper recording of parameters viz. orientation, temp., R/R, P/R, & B.P is done. Two memory picture cards for performing amnesia test , are shown to the patient & told them to remember these two pictures. Patients of **group A & B** are given the Jatamansi Ghan Satva accordingly as premedication with a sip of water approx. 2 hours prior to surgery.

Proper I.V line is maintained with 18-20 FG vain flow canula in all the patients.

Just prior to induction proper recording of parameters viz. orientation, temp., R/R, P/R, & B.P is done again. In **group C** (Standard group) diazepam 0.2 mg/kg body weight is administered 1-3 min. prior to induction through I.V route.

After pre-oxygenation Ketamine in the dose of 2mg/kg body weight as bolus intra-venous is given to all the patients. During the per-operative phase a proper vigil is kept on the general condition & vitals of the patient.

Post –operative observations & Results

Patient were kept in recovery room under observation until they regained full recovery .1/2 hourly for 4 hours & 4 hourly for 12 hours . Recording of R/R, P/R, & B.P is done along with the strict vigil upon nausea, vomiting or any type of emergence reaction i.e visual & auditory hallucinations, terrifying delirium , vivid (pleasant or unpleasant) dreams, purpose less movements, psychotic behavior during recovery. After the patients had gained complete recovery few question regarding the experience of anaesthetic drug administration/surgical procedure/recovery phase were asked along with the query about the two memory picture cards shown for performing amnesia test were shown to

the patient in pre-operative phase. Two another memory picture cards for performing amnesia test are also shown to the patient & again told them to remember these two pictures.

Table 1:Pre-operative Assessment

Group	No. of patients	Average age	Average systolic B.P	Average diastolic B.P	Average P/R	Average R/R
A	10	35.8	136	86	88	18
B	10	32.8	140	84	82	19
C	10	30.4	126	82	81	18

Table 2

Percentile rise in systolic blood pressure & pulse rate after Ketamine anaesthesia

Group	Sign	Mean	S.D	S.E	'T'	'P'
A	Systolic BP	29.92	11.67	3.68	2.152	>0.05
	Pulse rate	17.33	9.15	2.89	1.895	>0.05
B	Systolic BP	28.52	12.61	1.46	4.467	<0.001
	Pulse rate	14.47	15.48	5.56	1.758	>0.05
C	Systolic BP	28.92	11.66	3.68	2.536	>0.05
	Pulse rate	13.85	8.61	2.72	4.251	<0.001

Table3

Mean ± SE of induction /Recovery time

Group	Induction time(Seconds)
A	15.25 ± 0.36
B	28.22 ± 2.16
C	30.90 ± 3.10

Table 4

Incidence of secretions, presence of excitatory phenomenon & adequacy of anaesthesia during induction

Group	Secretions	Excitatory phenomenon	Adequate anaesthesia	In-adequate anaesthesia
A	1(10%)	3(30%)	8(80%)	2(20%)
B	0	1(10%)	10(100%)	0
C	2	2(20%)	9(90%)	1(10%)

Table 5

Statistical comparison of incidence of secretion, excitatory phenomenon & adequacy of anaesthesia during induction

Symptom	Test	Group A & B	Group A & C	Group B & C
Secretion	Chi-Square	-	-	-
	P value	0.50	0.25	0.12
Excitatory phenomenon	Chi-Square	-	-	-
	P value	0.04	-	0.08
Adequate anesthesia	Chi-Square	-	-	-
	P value	0.24	0.38	0.5

Table 6

Patient's behavior in recovery room in different groups

Group	Calm	Disoriented	Violent	Rest-less	Depressed	Delirious
A	7(70%)	1(10%)	1(10%)	2(20%)	5(50%)	1(10%)
B	8(80%)	3(30%)	0	1(10%)	2(20%)	1(10%)
C	8(80%)	6(60%)	0	2(20%)	2(20%)	1(10%)

Table 7

Statistical comparison of Patients behavior in recovery room in different groups

Sign	Test	Group A & B	Group A & C	Group B & C
Calm	Chi-Square	-	0.1562	-
	P value	0.27	>0.06	0.27
Dis-oriented	Chi-Square	-	11.3960	2.5252
	P value	0.02	<0.001	>0.05
Violent	Chi-Square	-	0	-
	P value	0.02	-	0.02
Rest-less	Chi-Square	0.1111	0	-
	P value	0.23	-	0.16
Depressed	Chi-Square	1.1408	5.3846	-
	P value	>0.05	<0.05	0.16
Delirious	Chi-Square	-	-	-
	P value	0.51	0.4	0.4

Table 8 :Incidence of hallucination, bizarre feelings & other specific difficulties during and after anaesthesia

Group	hallucination	Visual disturbances	Bizarre feelings	Pain	Floating sensations	Sickness	Fear & worry
A	2(20%)	1(10%)	2(20%)	5(50 %)	2(20%)	2(20%)	4
B	0	0	0	3(30 %	1(10%)	1(10%)	3(30%)
C	2(20%)	1(10%)	2 (20%)	2 (20%	1(10%)	1(10%)	2(20%)

Table 9:Statistical comparison of Incidence of hallucination, Bizarre feelings & other specific difficulties during and after anaesthesia

Sign	Test	Group A & B	Group A & C	Group B & C
hallucination	Chi-Square	-	-	-
	P value	0.12	0.12	0.33
Visual disturbances	Chi-Square	-	-	-
	P value	0.24	0.24	0.39
Bizarre feelings	Chi-Square	-	-	0.1560
	P value	0.53	0.53	>0.05
Pain	Chi-Square	2.6041	3.8410	-

	P value	>0.05	<0.05	0.27
Floating sensations	Chi-Square	-	-	-
	P value	0.02	0.24	0.16
ickness	Chi-Square	-	-	-
	P value	0.12	0.5	0.25
Fear & worry	Chi-Square	2.52	3.68	0
	P value	>0.05	>0.05	-

Table 10

Incidence of vivid dreams, amnesia & other subjective feelings after recovery from anaesthesia

Group	vivid dreams	Anti-grade amnesia	Retrograde amnesia	Depressed	Feeling of Indifference
A	4(40%)	2(20%)	0	7(70%)	3(30%)
B	2(20%)	1(10%)	0	3(30%)	6(60%)
C	3(30%)	5(50%)	1(10%)	2(20%)	5(50%)

Table 11:Statistical comparison of Incidence of vivid dreams & amnesia

Sign	Test	Group A & B	Group A & C	Group B & C
vivid dreams	Chi-Square	-	-	-
	P value	0.11	0.02	0.23
Anti-grade amnesia	Chi-Square	-	3.8400	7.2934
	P value	0.24	>0.05	<0.01
Retrograde amnesia	Chi-Square	0	-	-
	P value	-	0.24	0.24

Table 12:Acceptability of Ketamine anaesthesia in different groups

Group	Yes	No	Don't know
A	4(40%)	3(30%)	3(30%)
B	7(70%)	1(10%)	2(20%)
C	8(80%)	0	2(20%)

Table 13

Neuro-psychiatric adverse reactions

Sign/symptom	Group A	Group B	Group C
Clonus	-	-	-
Convulsion	-	-	-

Headache	2(20%)	1(10%)	2(20%)
Pleasant dreams	7(70%)	8(80%)	8(80%)
Un-Pleasant dreams	1(10%)	-	2(20%)
Visual disturbances	6(60%)	3(30%)	2(20%)
Hallucination	2(20%)	2(20%)	-
Purpose-less movements	2(20%)	1(10%)	2(20%)
Psychotic behavior	2(20%)	-	-
Giddiness	2(20%)	1(10%)	1(10%)
Nausea & Vomiting	1(10%)	-	-

Discussion: Induction was comparatively prompt in 15.25 ± 0.36 seconds in Group A patients in which Jatamansi Ghan Satva is given in the dose of 10 mg/kg body weight as a single dose 2 hours prior to the surgery as compared to Group B (28.22 ± 2.16 seconds) & Group C patients (30.90 ± 3.10 seconds).

B.P & P/R Group A patients in which Jatamansi Ghan Satva is given in the dose of 10 mg/kg body weight as a single dose 2 hours prior to the surgery showed comparatively less rise in Blood pressure & pulse rate as compared to group B & C

Secretions Increased salivary secretions are found only in 1-2% of patients only & are conspicuously absent in group B patients.

Excitatory phenomenon is found only in 1-3 % of patients only and is comparatively less in group B patients. Accordingly depth of anaesthesia was 100% adequately achieved in Group B as compared to 90% in group C & 80% of Group A.

During Recovery group B & Group C patients remained more calm (80%) as compared to Group A but surprisingly disorientation is seen comparatively in more (60%) patients who were administered diazepam in dosage of 0.2 mg /kg body eight as compared to Jatamansi Ghan Satva treated groups and is significantly less in Group A patients. Evidences of restlessness & delirium were only 1-2% while the post recovery depression was seen in 50% in group A as compared to only 20% in group B & C.

Feeling of auditory / visual hallucination, visual disturbances, bizarre feelings, floating sensations & sickness are seen only in 1-2% of the total patients & are absent or comparatively less in group B patients. Pain and fear were felt comparatively less in diazepam administrated group.

Incidence of **vivid dreams** are seen in 20-40 % of the patients **,** and incidence of **Anterograde amnesia** are significantly less in Group A & Group B Patients(10-20%) as compared to 50% which are there in Group C Patients. **Retrograde amnesia** is seen only in 10% patients of Group C only. Feeling of depression & indifference are comparatively observed more in Group A & Group B.

In regard to **acceptability** Ketamine with Diazepam as pre-medication is found to be more acceptable (80%) as the complaints of pain, fear & feeling of depression are encountered less in this group as compared to 70% acceptability in Group B & 40% Acceptability in group C.

Probable mode of action : The effects of Jatamansi Ghan-Satva can be explained on the bases of it effects on CNS viz. *Sangya-sthapan , Medhya, Balya, Akshep-shaman, vedna-sthapan , nidrajanan* & CVS viz. *Hridya-niyamak & Rakta-bhar shamak.*

Conclusion: Present study was done on 30 female patients of age group 20-45 years posted for short surgical procedures under Ketamine I.V bolus dose of 2mg/kg body weight as sole anesthetic agent as emergence reactions are more commonly seen in females.

- Induction was found to be more prompt in patients in which Jatamansi Ghan-satva is given in the dose of 10 mg/kg body weight as a single dose 2 hours prior to the surgery.
- Neither Jatamansi Ghan-satva nor Diazepam efficiently controlled the rise in P/R & Blood pressure after induction with Ketamine as sole anesthetic agent.
- In Jatamansi Ghan-satva pre-treated patients incidences of disorientation after recovery were significantly less.
- Feeling of auditory / visual hallucination, visual disturbances, bizarre feelings, floating sensations & sickness are less in Jatamansi Ghan-satva pre-treated patients in which this is administrated in the dose of 5mg/kg body weight twice daily for seven days prior & than in immediate pre-operative phase.
- Incidence of **vivid dreams** is seen in 20-40 % of the patients in all the groups.
- **Anterograde amnesia** are significantly less in Jatamansi Ghan-satva pre-treated patients as compared to diazepam pre-treated group
- **Retrograde amnesia** is not seen in Jatamansi Ghan-satva pre-treated patients & is only seen in 10% patients of diazepam pre-treated group. .
- Neuro-psychiatric adverse reactions except visual disturbances are comparatively less in Jatamansi Ghan-satva pre-treated patients.
- In regard to **acceptability** Ketamne with Diazepam as pre-medication is found to be more acceptable as compared to Jatamansi Ghan-satva pre-treated patients.

During this study it is found that both jatamansi ghan satva & diazepam were not able to fully control various emergence reactions, but the patients in whom the jatamansi ghan satva was administrated continuously for seven days as pre-medication showed better control over these adverse reactions in comparison to the patients in which Jatamansi Ghan-satva is given in the dose of 10 mg/kg body weight as a single dose 2 hours prior to the surgery & diazepam pre-treated group. To establish this fact study with bigger sample size & more assessment criteria is needed.

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Neonatal Pain Management (Modern Aspect)

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ABSTRACT

By 20 weeks of gestation the fetus is served by a highly differentiated and fully functional sensory system at this time, the pain experience is a dynamic process that links the nervous system to organ to organ systems through out the body, producing complex, measurable responses within those organ systems when stimulated. Pain perception may be more intense than in the adult, for several reasons. The large number of nociceptive nerve endings in the skin and mucous membranes of the fetus far exceed that in adults. Ascending pathways between the peripheral nervous system (PNS) and the spinal cord are rich in excitatory neurotransmitters which potentiate pain transmission , but poor in mediating neurotransmitters, which blunt the pain response.}

Although development of the complex structures of the central nervous system (CNS) parallels that in the PNS and a vast supply of neurons purveys the cortex itself, differentiation of structure and function in the cortex is a slower process and compromises preterm infants ability to integrate and assimilate pain information **(Anand ed al 1987, 1989)** . Their response, response patterns, both physiologic and behavioral, are less organized, less robust, less coordinated, and more difficult to interpret. They may become more easily disorganized with stress or may adapt to pain more readily. As many as 50% of premature infants do not exhibit crying behaviors during painful procedures **(Evans et al 1997; Johnlton et al, 1993, 1999).** Studies have also demonstrated that with repeated exposure to painful procedures infants may lose the ability to distinguish between painful and non painful stimuli and maintain hypersensitive states for protracted periods of time. This hypersensitivity persists even if non- noxious stimuli are introduced **(Evans, 2001 Fitzgerld et al, 1989).** In addition, local tissue injury resulting from repeated heelsticks and invasive procedures trigger increased proliferation of nerve endings in surrounding tissues, particularly when this damage occurs early in gestation. As a result scars, Old IV sites and surrounding tissues may remain hypersensitive well beyoud the neonatal period **(Eitzgerald et al, 1989; Reynolds and Fitzgerald, 1995).** Pain assessment is most challenging in preterm

infants who are caregivers are urged to keep in mind that the focus of these scoring tools is assessment of procedural pain and their use may leave gaps in effective in effective assessment for the infants who are paralyzed, asphyxiated, or experiencing chronic pain. In addition discrimination between pain and distress or agitation in the neonate is difficult, and a trial of therapies, both pharmacologic and nonpharmacologic, may occasionally be helpful. Assessments should be initiated on admission and then performed at regular intervals throughout the infant's hospitalization **(JCAHO, 1999).**

Scoring tools may use a unidimensional approach **(e.g., the Neonatal facial Coding system; Grunau et al, 1998)** in which one specific behavior or group of related behaviors is evaluated, or a multidimensional approach (e.g., Neonatal infant pain scale [NIPS]; **Lawrence et al, 1993**) in which complex behavioral and physiologic information is assessed simultaneously with all gestational age groups cry has been identified as the least reliable indicator of pain. And changes in facial expression, such as brow bulge, eye squeeze , nasolabial furrow taut lips and open mouth, as the most reliable **(Grunau and craig. 1987; guinsburg et al, 1997 : stevens et al , 1993).** Because of te complex nature of the pain experience, the infant's limited cognitive abilities, and the various ways that changes in physiologic parameters con be interpreted, the current recommendation has been to approach pain assessment with a multidimensional scoring tool. Such a tool adequately captures changes I bath behavioral and physiologic domains **(APS, 2001: Craig et al, 1993 ; franck et al 2000)** A variety of pain scoring tools are available for use in the neonatal population. A few multidimensional tools that have been well studied and used extensive in the neonatal population are reviewed here.

The CRIES change system was established as a neonatal post operative pain scoring tool and has been proven to be clinically valid **(Krechel and Bicher 1995 CRIES**) is an acronym for an assessment approach that is comprised of five indicators, three behavioral and two physiologic. Each indicator is evaluated on a scale of 0 to 3. The score ranges from 0 to 10 with a score of 4 or higher indicating pain. Although initially established as a tool to assess postoperative pain. CRIES have been useful in the broader range of neonates and is now widely used clinically.

Table -1

CRIES : Neonatal postoperative pain assessment score			
Scoring Criteria			
Indicator	**0**	**1**	**2**
Crying	No cry, or cry not high pitched	High- pitched cry but consolable	High- pitched cry inconsolable
Requires oxygen for saturation>95%	No oxygen required from baseline	Oxygen requirement <30% from baseline	Oxygen requirement >30% from baseline
Increased vital signs	Heart rate and blood pressure are bath unchanged	Heart rate or blood pressure in increased by <20%	Heart rate or blood pressure in increased by >20%
Expression	None (no grimace)	Grimace only is present	Grimace and nonaudible grunt present
Sleeplessness	Continuously asleep	Awakens at frequent intervals	Awake constantly

Measure blood pressure last so as not to awaken infant.

Grimace consists of lowered brow, eyes squeezed shut, deepening nasolabial furrow, and open lips and mouth

Adapted from **Bildner J. Krechel** increasing staff nurse awareness of postoperative pain management in the NICU. Neonatal netw 15-11-16, 1996 @ **S. Krechel, MD and biskner , RNC CHS** (Developed at university of Missouri- columbia)

MANAGEMENT OF PAIN IN INFANTS

Effective pain management is a systematic approach that combines judicious use of pharmacologic and nonpharmacologic interventions. Because pain expression can be influenced by multiple contextual factors, management strategies should be comprehensive and should include the following aspects **(Walden, 2001; Franck et al. 2001)**:

- Minimization of handling before invasive procedures when the infant's state is most protective.
- Decrease in the number of painful interventions and noxious stimuli that infants are exposed to as part of bedside care.
- Timing of medication administration around necessary interventions.
- Optimization of skill levels of staff performing procedures
- Use of an interdisciplinary team to evaluate the effectiveness of interventions
- Listening to family assessments and suggestions.

Non pharmacologic Interventions:

The complimentary effects of non pharmacologic interventions have been well described in the literature. Additional information about various therapeutic modalities, including alternative therapies, and music, are available on the selected reading list. A few of the more research based interventions are discussed here.

Sucrose pacifiers:

Research based evidence supports the use of single does sucroses as non pharmacologic pain intervention in term and preterm infants **(Stevens et al, 2000).** Meta analysis of four studies confirmed that a single dose of sucrose administered orally can reduce the time infants spend crying after completion of a painful procedure; this effect is thought to be mediated by the endogenous release of opioids stimulated by the sweet taste. Consensus has not been reached regarding dosage and method of administration. Beneficial effects have been documented in preterm infants after oral administration of 2 ml of 12% to

25% dextrose solution 2 minutes before painful procedures as well as with pacifiers dipped in 24% sucrose solutions and administered 2 and 5 minutes prior to painful procedures. Some concern has been raised about the potential for increased risk of necrotizing enter colitis as a result of repeated administration of hyper osmolar dextrose solutions to the premature gut. Although no adverse effects were reported for use of the approaches in these studies, caregivers are urged to review the corresponding literature before incorporating this approach into guidelines for pain management practices.

Positioning:

Supportive positioning and containment have been effective in reducing procedural distress and promoting self-regulation **(Porter et al, 1998).** Facilitated tucking, a technique in which caregivers used their own hands to contain an infant's limbs close to the trunk, has also been shown to reduce pain responses in preterm infants **(Corff et al, 1995)** and can be used regularly throughout the course of bedside care.

Non opioid Analgesics

Acetaminophen:

Acetaminophen is the most widely administered analgesic in patients of all ages. Acetaminophen inhibits the production of cyclooxygenase in the central nervous system and peripherally blocks pain impulse generation **(Arana et al, 2001).** Neonates are able to form the metabolite that results in hepatocellular damage. **(Arana et al, 2001);** how ever, it is inappropriate to withhold acetaminophen in newborns because of concerns of liver toxicity. The immaturity of the newborn's cytochrome P-450 system may actually decrease the potential for toxicity by reducing production of toxic metabolites **(Collin, 1981).**

Current recommendations are for less frequent oral dosing, evey 8 to 12 hours in preterm and term neonates, because of slower clearance times, and higher rectal dosing due to decreased absorption **(Arana et al, 2001; van Lingen et al, 1999).** Typical oral dosages for acetaminophen are 10 to 15 mg/kg/dose every 6 to 8 hours for neonates and 10 to 15mg/kg/ dose every 4 to 6 hours for infants. Administering 10mg/kg may be inadequate for pain control as this dose is based on antipyretic dose- response studies. The maximum dose is 75 mg/kg/24 hours for infants, 60 mg/kg/24hours for terms and preterm neonates more than 32 weeks of postconceptual age, and 40mg/kg/24 hours for preterm neonates 28 to 32 weeks of postconceptual age **(Berde, 2002).**

Rectally administered acetaminophen has a longer halflife, but absorption is highly variable because it depends on the indivisual infant and placement of the supporsitory.

Nonsteroidal Anti-inflammatory drugs:

Nonsteroidal anti-inflammatory drugs (NSAIDs) inhibit prostaglandin synthesis by inhibiting the action of cyclloxygenase. Cyclooxygenase enzymes are responsible for the breakdown of arachidonic acid to prostaglandins. NSAIDS have significant adverse effects, including decreased glomerular filtration rate and platelet dysfunction. These adverse effect are particularly worrisome for neonates and infants. NSAIDS are not generally recommended in neonates because of concerns about intestinal perfusion.

Indomethacin:

Indomethacin has been widely used to promote closure of the patent ductus arteriosus (PDA) and also to prevent intraventricular hemorrhage.

Opioid Analgesies:

Opioids provide the most effective treatment for moderate to severe pain in patients of all ages. There is a wide range of interpatient pharmacokinetic variability. Opioid dosing depend on the severity of the pain as well as the age and clinical condition of the infant. Opioids should be used in infants younger than 2 months only in a monitored setting such as an intensive or intermediate care unit **(Yaster et al, 2003).** Some clinicians propose a more conservative recommendation, restricting use of opioids to monitored settings for any infant younger than 6 months.

Morphine:

Morphine, the “gold standard” for pain management, is widely used in neonates. In order children and adults, morphine in metabolized in the liver and forms an active metabolite, morphine 6 glucuronide (M6G), and a second metabolite, morphine 3 glucuronide, that may be antianalgesic under some circumstances. However, little is known about the relative concentration of these metabolites in preterm infants. There is a potential for the respiratory depression due to a delayed release of morphine from less well perfused tissues and the sedating properties of the metabolite M6G **(Anand et al, 2000).**

Clearance or elimination of morphine and other opioids is prolonged in infants owing to the immaturity of the cytochrome P-450 system at birth. Hepatic function reaches

adult levels at 1 or 2 months of age. The rate of elimination and clearance of morphine in infants 2 months and older is similar to that in adults. Chronologic age seems a better indicator than gestational age of how an infant metabolizes opiods **(Scott et al, 1999; Yaster et al, 2003).**

Infants are at greater risk of respiratory depression because of their immature responses to hypoxia and hypercarbia. There is an increase in unbound or free morphine available to reach the brain as a result of the reduced concentration of albumin and alpha$_1$. acid glycoproteins **(Houck, 1998).**

Hypotension, bradycardia, and flushing constitute the response to the histamine release and rapid intravenous administration of morphine. Histamine release may cause bronchospasm in infants with chronic lung disease, although this in not commonly seen **(Anand et al, 2000).**

There is a wide range of interpatient pharmacokinetic variability. For nonventilated infants, the initial opioid dose is approximately one fourth to one third the recommended dose for older children. For example, 0.03 mg/kg of morphine IV can be used as a starting dose **(AHCPR, 1992).** For ventilated infants, 0.05 to 0.1 mg/kg of morphine IV is an appropriate starting dose. Titration to the desired clinical effect is required in adjusting both the dose and the frequency of administration.

Fentanyl:

Fentanyl is 80 to 100 times more potent than morphine. Fentanyl causes less histamine release than morphine, making it a more appropriate choice for infants with hypovolemia, hemodynamic instability, or congenital heart disease. Another potential clinical advantage of fentanyl is its ability to reduce pulmonary vascular resistance, which can be of benefit for infants who have undergone cardiac surgery, have persistent pulmonary hypertension, or need extracorporeal membrance oxygenation **(Anand et al, 2000).**

Fentanyl must be administered over a minimum of 3 to 5 minutes to avoid chest wall rigidity, a serious side effect observed after rapid infusion. Chest wall rigidity, which can result in difficulty or inability to ventilate, can be treated with naloxone or a muscle relaxant such as pancuronium or vecuronium.

Fentanyl is highly lipophilic. It has a quick onset and relative short duration of action. Owing to fentanyl's short duration of action, it is typically used as a continuous infusion for postorperative pain. In infants 3 to 12 months of age, total body clearance of fentanyl is greater than that of older children, and the elimination half-life is longer owing to its increased. Volume of distribution **(Singleton et al, 1987)**. Fentanyl has been demonstrated to have a prolonged elimination half-life in infants with increased abdominal pressure **(Gauntlett et al, 1988; Koehntop et al, 1986)**

A rebound transient increase in plasma fentanyl levels is a phenomenon known to occur after discontinuation of therapy in neonates. It is a result of fentanyl's accumulation in fatty tissues, which may prolong its effects after continued used. Therefore, caution must be exercised in the use of repeated doses or a continuous infusion.

Oral Opioids:

Oral methadone can be used to wean infants from long-term opioid use. Methadone is widely used in neonates and children, although there are limited data on its efficacy and pharmacokinetics in this population **(Chana and Anand, 2001; Suresh and Anand, 1998).** The respiratory depressant effect of methadone is longer than its analgesic effect. Methadone is metabolized very slowly, and its half-life is very long.

Codeine is prescribed at 0.5 mg to 1mg/kg orally every 4 hours as needed. Most pharmacies supply acetaminophen and codeine in a set formula, consisting of acetaminophen 120mg and codeine phosphate 12mg per 5 ml with alcohol 7%. The dose prescribed is limited by both the appropriate dose of codeine and the safe dose of acetaminophen.

Oxycodone dosing is 0.05 mg/kg to 0.15mg/kg orally every 4 to 6 hours as needed. The liquid form is not universally available.

Mixed Agonist-Antagonist Drug:

Nalbuphine is a mixed agonist-antagonist drug; therefore its administration to infants of opioid-addicted mothers may precipitate withdrawl. This agent is equianalgesic with morphine. Nalbuphine has a ceiling effect for analgesia. Additional studies are needed on the safety and efficacy of nalbuphine use in infants.

Sedatives-Benzodiazepines: Sedatives-benzodiazepines should not be used in place of an appropriate pain medication as this class of medication has no analgesic effect. Benzodiazepines are administered to decreased irritability and agitation in infants and to provide sedation for procedures. In ventilated infants, benzodiazepines can help avoid hypoxia and hypercarbia from beathing out of "sync" with the ventilator. For painful procedures, an analgesic must be used in conjunction with the benzodiazepine.

Topical anesthetics

EMLA Cream:

For infants 37 weeks of gestation and older, EMLA **(Eutectic mixture of local anesthetics)** cream to desired area and then cover with an occlusive dressing for 1 hour before the procedure. Longer application times provide deeper local anesthetic penetration but may potentially lead to toxicity. There is a slight risk of methemoglobinemia with use of EMLA cream in infants and G6PD-deficeint patients. A rare occurrence, methemoglobinemia can occur when hemoglobin is oxidized by exposure to prilocaine. EMLA should not be used in patients with methemoglobinemia or infants younger than 12 months who are also receiving methemoglobinemia inducing drugs, such as acetaminophen, sulfonamides, nitrates, phenytoin, and class I antiarrhythmics. **Procedural Pain:**

Some invasive procedures are obviously considered painful. Routine care performed in a neonatal unit, such as diaper changing and bathing, may not typically be thought of a painful but can be distressing to the neonate as indicated by changes in oxygen saturation and heart rate. Nonpharmacologic treatment should be routinely employed for stressful procedures, and pharmacologic treatment should be used for painful procedures. Infants are beginning to receive adequate pain management for postoperative pain, but unfortunately, little progress has been made in managing procedural pain for such patients.

Circumcision:

The Circumcision policy Statement of the American Academy of Pediatrics (AAP) states that analgesia must be provided to infants undergoing circumcisions. EMLA cream, dorsal penile nerve block, and subcutaneous ring block are all possible options. AAP reports that subcutaneous ring block may provide the best analgesia **(Circumcision, 1999).**

Subcutaneous ring block has been found to be more effective than EMLA or dorsal penile nerve block in other studies **(Lander et al, 1997).** Dorsal penile nerve block has been

found to be more effective than EMLA, but this method is not always available **(Lee and Forrester, 1992).**

EMLA has been established as superior to placebo for pain relief during circumcision **(Bennini, 1993; Taddio, 1997).** An effective method for applying EMLA in preparation for circumcision is to apply one third of the dose to the lower abdomen, extend the penis upward gently, pressing it against the abdomen, and then apply the remainder of the dose to an occlusive dressing placed over the penis. This dressing is then taped to the abdomen so the cream surrounds the penis. Another method is to apply the cream and then place plastic wrap (Saran Wrap) around the penis in a tubelike fashion to help direct the urine stream out and away from the cream.

Acetaminophen is ineffective for the management of severe pain associated with the circumcision procedure but does provide some analgesia in the postoperative period. Acetaminophen has been found to decrease pain 6 hours after circumcision **(Howard et al, 1994).**

EMLA Cream: Recommended Maximum Dose by Age and Weight:

Age and Body weight	**Maximum total EMLA Dose**	**Maximum Application Area**	**Maximum Application time**
Birth- 3mo or <5kg	1 g	10 cm^2	1 hr
3-12 mo and >5kg	2 g	20cm^2	4 hr

Blood Sampling and Monitoring:

Heelsticks are routinely performed to obtain blood samples in neonates. The most appropriate method for relieving pain from a heelstick is yet to be determined. Heels should be warmed to aid blood sampling. EMLA does not relieve the pain of a heel lance **(Stevens et al, 1999b; Taddio et al, 1998). Shah and colleagues (1997)** demonstrated that neonates experiencing venipuncture had lower pain scores than those who underwent heelstick for blood sampling. In healthy neonates, venipuncture should be used preferentially over heelstick.

The pain of arterial puncture can be decreased by infiltrating around the site with 0.1 to 0.2 mL of 0.5 or 1% lidocaine using the smallest gauge needle possible **(Franck and Gregory, 1993).** Buffering the lidocaine with sodium bicarbonate is recommended to decrease the burning caused by lidocaine. EMLA may reduce the pain of arterial puncture.

Other Invasive Procedures:

Placement of a central venous line requires topical anesthesia with EMLA or infiltration of the skin with lidocaine. Additionally, a parenteral opioid such as fentanyl is typically required.

The pain of a lumbar puncture is compounded by both the needle puncture and the distress caused by the body position required for the procedure. EMLA has been shown to decrease the pain of lumbar puncture in children **(Halperin et al, 1989).** Chest tube insertion requires an intravenous opioid, adequate local analgesia. Or both.

Mechanical Ventilation:

Because intubation can raise both blood pressure and intracranial pressure, a short acting benzondiazepine such as midazolam can be beneficial. Midazolam can be used for infants with stable cardiovascular function; fentanyl can be used as an alternative for infants with compromised cardiovascular function. **(McClain and Anand, 1996).** Any infant who is pharmacologically paralyzed during mechanical ventilation should receive adequate sedation. In addition, the infant should receive pain medication in pain is suspected from the infant's condition or because of the procedures being performed.

Antagonizing pain Management:

Small incremental doses of naloxone may make it possible to reverse respiratory depression without adversely affecting analgesia. Naloxone, 1 to 10μg/kg given as an IV push (IVP) or subcutaneously (SC), is recommended for infants with mild somnolence. For apnea or respiratory arrest, an initial dose of 10μg/kg IVP or SC followed by 1μg/kg titrated to effect is recommended to avoid sudden hemodynamic effects. After the administration of naloxone, the infant must be observed, because the duration of naloxone is significantly shorter than the duration of an opioid. Naloxone can lead to seizures in opioid- dependent patients.

The use of flumazenil for reversal of benzodiazepines has not been investigated in infants.

Physical dependence, Tolerance, and Addiction:

Physical dependence is demonstrated by the need to continue the administration of the drug to prevent signs or symptoms of physical withdrawal. Tolerance is a reduction in the drug effects after repeated administration, or the need to increase the dose to achieve the same clinical effect. *Addiction* is compulsive drug taking behaviour **(Gutstein and Akil, 2001).** Infants are not capable of being addicted to a drug.

Weaning Considerations:

Baseline pain and weaning scores should be obtained prior to beginning the weaning process, and infants should be reassessed every 2 to 4 hours for signs of withdrawal. In addition, when an opioid dosage is being tapered, the infant must be assessed for the presence of pain a minimum of every 4 hours. If an infant is receiving both an opioid and a benzodiazepine, it is prudent to taper and stop only one class of medication at a time. Typically, a weaning schedule is 10% of the total initial dose per day, or 20% of the initial dose every other day. Many patients can tolerate a relatively large initial decrease in dose, but subsequent decreases may need to be smaller. Environment should be eliminated or reduced wherever possible. It should be noted that the potential onset of withdrawal symptoms varies according the half-life of the opioid or benzodiazepine and the half-life of active metabolites, which may be much longer than that of the parent compound **(Tobias, 2000).**

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APPEAL

All the life members who had already paid Rs. 500.00 as Life Membership fee are requested to send a DD of Rs. 500.00 in favor of A.A.I.M. payable at Varanasi for purchase of Land of office of Association (C.C.) at Varanasi. The members who will donate Rs. 1001.00 or more will be presented a certificate and their name will be published in the Journal with their Photographs. Due to increase in Postal Charges the Journal will be send only to those members who will send Rs. 100.00 as Postal Charges by M.O./ D.D. in favor of *Sangyaharan Shodh*.

An analytical study of "*Ayurvedo Amritanam*"

Dr. Murlidhar Paliwal

Abstract

Ayurved, an eternal system of medicine[1], which is our heritage, is serving society since time immemorial. After so many ups and downs, it is existing in its own form due to holistic approach toward human beings. It is its *Amritatwa* (Property similar to Nectar) because of that not only India but many more foreign countries are also being attracted by the glory of Ayurveda. Foreign people are very eager to know the Ayurveda as a mean of the better health.

The term Ayurveda consists two words-Ayush +Veda. Ayush means life & Veda means knowledge. So Ayurveda deals with knowledge of life[2]. Its impact is seen in all the aspects of life very vividly.

Key words - *Ayurvedo* (Ayurved), *Amritanam* (among immortal ones), Brihat-trayee, utility, diet, Regimen, Medicine.

Introduction:

Ayurved deals with the fundamental as well as applied aspects of knowledge of life. It's utility starts with the existence of life (Ayu).Acharya Chakrapani, the great commentator also quotes that it is the best among all to fulfill the quest for longevity of life span in the commentary of "Ayurvedo Amritanam" mentioned in Yajjah Purushiya Adhyay of Charak Samhita. Ayurved instruct about daily routine[3], seasonal routine[4], Sadvritta[5] for the protection & promotion of health and how to live in society as well as cure of all the curable diseases[6].

Nidan sthan and Chikitsa Sthan of Brihat-trayee i.e. Charak Samhita, Sushruta Samhita and Vagbhat are specially designed for the diagnosis and cure of the various diseases.

As it is said that Ayurved is science of life, is true in the sense that use of Ayurvedic knowledge starts right from fertilization to death, home to office, individual to society, ethics to politics , diet & regimen to medicines& so on.

Few of the examples are being given here in this article to prove that how Ayurved is the best among immortal ones and bringing about immortality.

Fertilization to Birth-Ayurved describes fertilization in three phases i.e. before fertilization, during fertilization & after fertilization. According to phase, diet & regimen is described to achieve the healthy baby.

Sattwik diet & regimen such as-milk, ghee, less spicy & fresh diet, mental happiness, cleanliness, thinking of holy things, to avoid sexual intercourse during menstrual period is indicated in Ayurved to follow before fertilization[7].As per the view of Ayurveda diet and regimen strengthen both the body and mind.

A person having 25 year's age should intercourse with lady who is at least 16 years old on 4^{th}, 6^{th} , 8^{th} ,10^{th} ,12^{th} day of commencement of menstrual flow to get male child & 5^{th},7^{th},9^{th},11^{th} day of menstrual flow to get female child[8]. It indicates the essentiality of maturity before trying for progeny. Days mentioned for intercourse may be experienced based.

After fertilization *Pumsavan samskar* is also mentioned to get favorite & healthy male or female child[9]. Month wise diet is indicated in Charaka Samhita[10], Susruta Samhita[11] & other text of Ayurved for proper growth of baby (mainly milk & Ghee is indicated)

Birth to Death- Ayurved advocates so many procedures after birth of child such as-*Jatkarma samskar(*birth-rites)*), Raksha vidhan*(protection of new born),*Namkaran samskar*(rites for naming the child) , Examination of *dhatri* (examination of wet nurse), *stan pariksha*(examination of mammary glands),*stanya pariksha*(examination of milk) special type of *Kumaragar*(child ward)&kridanakas(special & hurtless toys),principles of treatment of pediatrics are very well mentioned by Charaka Samhita which is an authentic book of Ayurveda[12].

Each & every activity or progress of child should be celebrated as samskaras (ritual ceremony) as per indications of Ayurved. Even suitable age for marriage is also indicated by Ayurvedic classics[13] which shows deep concern with humanity being science of life.

Dinacharya (daily routine), *Ritucharya* (seasonal regimen), *Ahar Rasayana & Sadvritta* (codes of good conducts or medical ethics) & *Aharvidhi vidhan* (scientific dietary guidelines) are well elaborated in Ayurveda for better health and to prevent diseases and nevertheless untimely death.

Ayurved discuss in very detail about the protection and promotion of health and cure of the ailments to save the life of the living beings up to the last moment as it is always concentrate on *Bhutdaya* (pity on living beings).

Ayurved prefers --Wholesome, balanced & timely diet.

-Acts & deeds which are accepted to noble & great personalities

-Diet & regimen according to seasons.

-Individual as well as social peaceful atmosphere through ethics.

-If due to certain avoidable or unavoidable causes diseases occur, treatment of these diseases through holistic approach.

The main aim and object of Ayurved is to maintain *Dhatusamya*[14] (equilibrium state of body tissues i.e. health) and ultimately long life

Home to office-

Ayurved is not only concern with health issue but it instructs about life style at our home, market, community &office also. As Ayurveda advise -

Be truthful & free from anger,

Peaceful nature & measured sweet words

Non-violent (*ahimsak),*

Absolutely free from barbarous acts

Be free from ego

Obey teachers, preceptors, old people & elders

Good conduct & broad mind

All these qualities mentioned by Ayurved[15] leads to happy, enthusiastic & prosperous life.

Ethics to politics-

Ayurved advocates about politics also along with different type of ethics mentioned above. Such as-

-Avoid company of the person who is jealous of the king or king dislike[16].

-Do not treat the person who is jealous of king or king dislike him/her.[17]

-Do not treat person who is not obedient to physician, about to die &enemy[18].

-King is to be protected first from all the unwanted happenings[19].

-Speak, laugh or suggest any view looking toward the mood of the king.

-Ayurved suggest for royal physician's appointment near king's palace[20].

Hence Ayurved deals with political aspect of the life also for the proper functioning and to achieve desired results.

Individual to society-Man is an inseparable unit of society by which society is formed. So whatever is discussed above is similarly useful for individual as well as society. Individually Ayurved suggest wholesome diet &regimen which in turn leads to public health also. Ayurved suggest much more for social peace. Such as[21]-

-Be helpful in troublesome conditions of others

-Help the poors

-Honour the guests

-Respect the persons who are learned, intelligent, teachers & old aged

-Maintain brotherhood

-Never create sinful acts even with persons who are engaged in sinful acts

-Never try to get property of others

-Do not take interest in opposition

All the instructions are equally important for individual as well as society and are the need of present day scenario.

Diet & regimen to medicines-

All the Ayurvedic classics emphasize on diet & regimen abundantly. *Charakokta Ashta Aharvidhi vesheshayatana*, *Sushrutokta dwadashan vichar, Vagbhatokta saptavidh ahar kalpana* etc. are few of the important instructions related to diet and daily routine, seasonal routine, good codes of conducts are related to both the diet and regimen.

All the Charak Samhita, Susrut Samhita, Ashtanga Samgrah, Ashtang Hridaya,Sharangadhar Samhita,Bhavprakash etc.) deals with both the prevention & promotion of health and cure of diseases. Nidan sthan and Chikitsa Sthan of Brihat-trayee i.e. Charak Samhita, Sushrut Samhita and Vagbhata are specially written for the cure of the various diseases.

Conclusion-

Thus we can say that utility of Ayurved starts with the existence of life which is well versed. Ayurved is not only concern with medicines but it is the science of life also as it is concerned with the physical, mental, spiritual, social, cultural, economical & political aspects of life very deeply.

After the thorough study of the subject, it is justified that Ayurved is the best among immortal ones and bringing about immortality i.e. "*Ayurvedo Amritanam"*[22].

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6, Sushrut Samhita Sutrasthan

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8. Ashtanga Hridaya Sutrasthan-3

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ANESTHESIOLOGY NEWS

- **ASA** Smokers Experience More Postoperative Pain Than Nonsmokers Study shows that smokers experience more severe pain after ambulatory surgery and might be more vulnerable to developing chronic pain. *edscape Medical News*, October 2010
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- Axillary Reverse Mapping Limits Lymphedema After Breast Cancer Surgery In patients undergoing surgery for breast cancer, axillary reverse mapping - identifying and preserving the lymphatics draining the arm - can cut down rates of lymphedema, according to data presented this week at the ASCO 2010 Breast Cancer Symposium in Washington, DC.*Reuters Health Information*, October 2010
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☞ Out station cheques should be accompanied by Rs. 50/- as Bank charges. Cheque/Draft/Money Order should be send in favor of Association of Anesthesiologist of Indian Medicine, Varanasi.