

ORIGINAL ARTICLE**Role of Percutaneous Bone Marrow Injection in Non Union of Fractures**

Shivraj S Konde¹, Santosh S Borkar², Sidheshwar R Thosar³, Ajaykumar R Allamwar³, Prashant S Kamath²

Author's Affiliations: ¹Associate Professor; ²Professor & Head; ³Resident; Department of Orthopaedics, MIMER, Talegaon, Pune

Correspondence: Dr. SantoshS. Borkar, Email:santoshborkar197616@gmail.com

ABSTRACT

Introduction: In hypertrophic non union rigid fixation is needed, in atrophic non union of bone biological solution is needed either bone graft, bone growth factors, stem cells, demineralised bone matrix etc. We preferred to do bone marrow injection as it will be cost effective without donor site morbidity.

Methodology: We included 30 patients of non union of long bones presented to MIMER medical college from April 2012 to March 2016 were selected for prospective study. Bone marrow injection of 20 ml to 40 ml was aspirated from iliac crest and injected with aseptic precaution under C-arm guidance. We followed them for the period of 6 months.

Results: 17 males and 11 females, mean age was 37.2 years. Union was achieved in 22 of 28 patients were treated by bone marrow injection.

Conclusion: Bone marrow injection treatment is relatively less invasive and cheaper than bone grafting procedure.

Keywords: Non union, delayed union, Bone marrow injection, fractures

INTRODUCTION

There are basically two types of non union of fractures, hypertrophic and atrophic. In hypertrophic non union there is attempt at union taking place and there is exuberant callus formation but lack of stability of bone fragments needed for union.¹ Here mechanical intervention like changing the implant with more rigid ones may help in union, however when there is paucity of callus formation and bone ends are not showing any attempt at union (sclerosed bone ends, occluded bone marrow cavity) i.e. in atrophic non unions of bone. Mechanical solution will not be helpful. Most of the times biological solution is needed.² It can either be bone grafts, natural or synthetic bone growth factors, platelets rich plasma with its platelet derived and other growth factors, stem cells from mesenchymal cells collected from bone marrow, demineralised bone matrix etc.³ However due to easy and cheap availability and consistent results most of the times bone grafts are preferred.⁴ However it has its own disadvantages. In addition to donor site morbidity, there is need to open the non union fracture site. This can cause devascularization of fracture ends and entail addi-

tional trauma.^{4,5} Cells aspirated from bone marrow provide osteogenic stimulus for union of fractures.^{5,6} Hence we decided to aspirate bone marrow by bone marrow aspiration needle from iliac crest and inject it percutaneously at the non union site. This causes less trauma to patient fulfilling our aim of induction of osteosynthesis theoretically.^{2,7} Hence we decided to carry out this study. Also this will save open risk introduction and will be cost effective.

METHODOLOGY

We excluded infected and paediatric patients (less than 18 years), non union cases with significant (more than 1 cm) gap non union. 30 cases of non union of long bones who presented to MIMER Medical College Hospital from April 2012 to March 2016 were selected for prospective follow up study. Local ethical committee approval was obtained and patients informed written consent was obtained on a form. However 2 patients were lost to follow up during the study. Bone marrow was aspirated from the iliac crest with the help of bone marrow aspiration needle. Then it was injected under aseptic precau-

tions in the operation theatre at non union site under C arm guidance without centrifugation. In non union of metacarpal fractures bone marrow injection was given (20ml). In other long bones 40 ml of bone marrow was injected under aseptic precautions and sedation I.V. and local anaesthesia. We did follow up of cases on opd basis after 6 wks. At the follow up in addition to clinical examination for fracture mobility and tenderness we did x rays AP and Lateral views. We did not repeat bone marrow injections at all. We used 16 gauge bone marrow aspiration needle for bone marrow aspiration from iliac crest (anterior portion) and used 16 gauge standard disposable needle for injection of bone marrow at nonunion site under C arm guidance in O.T.

RESULTS

There were 17 males and 11 female patients. Mean age of patients was 37.2 yrs.

All 5 patients with nonunion of femur united within 6 months. Also patient with nonunion of radius and ulna and 2 with nonunion of metacarpals united.

Table 1: Bones affected

Bones	Frequency (%)
Femur	5 (17.86)
Tibia	20 (71.43)
Radius & Ulna	1 (3.57)
Metacarpal	2 (7.14)

Table 2: Types of Fixation

Types of Fixation	Frequency (%)
Intramedullary Nailing	16 (57.14)
Open reduction and plating	4 (14.29)
K wiring	2 (7.14)
Plaster Cast	6 (21.43)

Table 3: Union or Nonunion after bone marrow injection

Bone	Union	Non union
Femur	5	0
Tibia	14	6
Radius & Ulna	1	0
Metacarpal	2	0

Table 4: Cases classified as per Judet Muller Weber, Cech classification

Type	Nonunited fractures	Fractures united after bone marrow injection (%)
Hypertrophic	20	16 (80)
Atrophic	8	6 (75)

Out of 20 tibia cases 6 patients failed to unite even after 6 months. Of these 2 patients were nailed earlier and 2 patients were plated earlier and 2 patients had under gone casting earlier.

Mean time for union was 12.2 +_ 4.2 weeks. Mean time for radiological union was 15.1 +_ 6.3 weeks. Union was achieved in 22 out of 28 patients i.e. 78%. Out of 28 patients 20 had non union of tibia, 5 had non union of femur and one patient had non union of radius and ulna and 2 non union of metacarpals. All five patients with non union of femur were treated with exchange nailing with larger size nail and bone marrow injection. Out of 20 patients of non union of tibia six patients were treated with plaster cast and rest 14 were operated, 10 with intramedullary nailing and 4 with plating. Earlier in these cases we just did bone marrow injection except those cases in whom Implants had broken (2 nails and 2 plates) In broken implants after removal of implants, appropriate Implants were used in addition. One patient with nonunion of radius and ulna had undue square nailing elsewhere and were not changed. Two cases of non union of metacarpals had not united despite k wire insertion.

DISCUSSION

In our study 6 patients of fracture tibia could not unite despite bone marrow injection. This were open fractures initially which had poor soft tissue coverage and blood supply in general. Autologous bone grafting has two rules 1) osteoinduction (that is stimulating bone formation) 2) osteoconduction (that is structural framework for union) .

However bone marrow Injection though is rich in cells stimulating unionis not giving osteoconduction advantage. Hence we excluded cases with significant bone gap prior to our study.^{8,10} Amount of bone marrow aspirated and injected is matter of controversy but it has been shown by others that efficacy of injected marrow is directly related to number of progenitor cells. It has been shown that increasing concentration of bone marrow by centrifugation is helpful to increase its osteogenic potential.⁹ We injected about 40 ml marrow , as we feel that most of the cases can accommodate 50 ml marrow , only as in many cases space is relatively small and we did not want to inject different amount of bone marrow in different patients and create bias in study , also we decided to inject only once as we feel that if treatment fail once there is no justification in trying same treatment again. In metacarpals space was so less so we decided to inject 20 ml only. We did not do centrifugation of bone marrow to keep our procedure easy and not spent time for process, as we want to inject freshly aspirated marrow only as soon as possible after aspiration. It has been argued that ideal

time for bone marrow injection should be after initial inflammatory period of fracture repair has been subsided (6-12 weeks) however this situation exists only in delayed union cases and will be preventive rather than therapeutic modality of treatment.⁸Hence we choose only non union cases (after 9 months of fracture without clinical and radiological sign of Union). In our study 22 out of 28 patients united, thus result was fairly good and comparable to other studies (75% to 95%). Also we did not counter major complication like infection etc.¹¹In some cases some pain at iliac crest was there for few days but subsided with simple NSAIDs only. In some studies bone marrow aspiration has been used in combination with osteoconductive materials for gap nonunion but we excluded such patients and cannot conclude about them.^{12,13}Out of 20 cases of hypertrophic nonunion 16 united after bone marrow injection and out of 8 cases of atrophic non-union 6 united after bone marrow injection. Thus bone marrow injection is helpful in treatment of both types of non union classified according to Judet Muller Weber, Cech.¹⁴

CONCLUSION

Bone marrow injection treatment is relatively less invasive and cheaper than bone grafting procedure with same osteoinduction properties with less comorbidity and complications. Hence it can be tried in nonunion cases without large gap.

REFERENCES

1. Percutaneous autologous bone marrow injection in the treatment of delayed and nonunion of long bones. Dr. Shrivastav Rakesh, Dr. Sagarsinh M Parmar NJIRM 2013; 4(2) 39-43
2. Connolly J, Guse R, Lippellol, Dehne R, Development of an osteogenic bone marrow preparation. JBIS Am 1989 Jun; 71(5):684-91.
3. Dr. Karma Uden Bhutia, Dr. Ashik A Bary, Prof. Arun Kumar Singh, Prof. A Mahendra Singh, Dr. Raghvendra Raghuvanshi, Dr. Christopher Hmar. Role of Percutaneous Autologous Bone Marrow Injection in Treatment of Delayed Union and Non Union of Long Bones. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). Volume 14, Issue 1 Ver. III (Jan. 2015); 07-13.
4. Simr, liangts, taybr. Autologous bone marrow injection in the treatment of delayed and nonunion in long bones. Singapore medical journal 1993; 34:412-7.
5. Singh AK, Shettys, Sarawathy JJ, Sin A. Percutaneous Autologous bone marrow injection for delayed and non-union of bones. Journal of Orthopaedic Surgery 2013.
6. Hernigou P, Mathieu G, Pognard A, Manicam O, Beaujean F, Rouard H. Percutaneous autologous bone marrow grafting for non unions, surgical technique. J.B.J.S Am 2006 Sep 88. (suppl 1 pt 2: 322-7)
7. Paley D, Yound MC, Wiley A et al. Percutaneous bone marrow grafting of fracture and bony defects. Clin Ortho 1986; 208:300-12.
8. Garg NK, Gaur S, Sharma S. Percutaneous autologous bone marrow grafting in twenty cases of ununited fracture. Auto orthopaedic scan d. 1993 Dec 64(6):671-2.
9. Muschler GF, Bochem C, Easley K. Aspiration to obtain osteoblast progenitor cells from human bone marrow. The influence of aspiration volume. JBJS Nov 1997; 79(11):1699-1710.
10. Timour P, El Hussein, Percutaneous bone marrow autotransplantation in the treatment of delayed and nonunion of long bones. Department of orthopaedic surgery. Ains Shams University Cairo 1997.
11. Firaz T, Ismael, Tikrit University. Tikrit Medical Journal bone marrow infection in patients in delayed and non union of long bone fractures 2008; 14(2):131 - 134.
12. McGaw WH, Horbin M. The role of bone marrow and endostium in bone regeneration. JBJS 1934; 14: 816-21.
13. Siegel HJ, Baird RC 3rd, Hall J, Lopez-Ben R, Kander PH. The outcome of composite bone graft substitute used to treat cavitary bone defects. Orthopedics 2008; 31: 754-758.
14. Megas P. Classification of non-union. Injury 2006 Sep; 37(9): 927.

ORIGINAL ARTICLE

Effect of Addition of Dexmedetomidine in Ropivacaine and Bupivacaine in Sensory and Motor Blockade and Post Operative Analgesia in Axillary Brachial Plexus Block for Hand and Forearm Surgery

Bhavna H Sojitra¹, Bhavna R Soni², Nikunj V Revdiwala³, Pragna N Vachharajani⁴

Author's Affiliations: ¹Assistant Professor;²Associate Professor; ³Resident;⁴Professor & Head, Department of Anaesthesia, SMIMER, Surat, Gujarat

Correspondence: Dr. Bhavna H. Sojitra, Email: bhsojitra2002@gmail.com

ABSTRACT

Introduction: Axillary approach of brachial plexus block provides excellent operating conditions for forearm and hand surgeries with less risk. The $\alpha_2:\alpha_1$ selectivity of Dexmedetomidine is eight times that of clonidine and its high specificity for α_2 subtype makes it a much more effective as adjuvant. The present study is designed to evaluate the effect of Dexmedetomidine as an adjuvant to 0.5% Ropivacaine hydrochloride with 0.5% Bupivacaine hydrochloride insensory and motor blockade and post operative analgesia axillary brachial plexus block in hand and forearm surgery.

Methodology: After institutional ethical committee clearance and informed written consent, prospective randomized controlled study of 60 patients of either sex, aged 18-60 years with ASA grade I, II and III undergoing forearm or hand surgery at SMIMER hospital was done. In Group 1, Inj. 0.5% Bupivacaine hydrochloride 20ml, Inj. 0.5% Ropivacaine hydrochloride 20ml and Inj. Dexmedetomidine (2 μ g/kg) were given. In Group 2, Inj. 0.5% Bupivacaine hydrochloride 20ml and Inj. 0.5% Ropivacaine hydrochloride 20ml was given. In operation theatre, Sensory blockade was assessed by three modalities. Pain (Pin Prick), Temperature (Alcohol wipe) and Touch (11 Point Scale). Motor Blockage by Lovett rating score, Sedation were assessed by Ramsay Score and Visual Analog Scale for Pain Relief were used.

Results: Demographic data like age, sex, weight of patients and surgical characteristics like duration & type of surgery were comparable in both the groups ($P>0.05$). The duration of motor blockade was significantly prolonged in Group 1 ($p<0.01$). VAS was comparable in immediate postoperative period upto 10 hrs but after that it became significantly higher in control group across the time. Mean total analgesic requirement (inj. Diclofenac sodium) was significantly less in 48 hours after performing axillary block in Group 1 (250 ± 35.95 mg) as compared to group 2 (405 ± 42.24 mg) ($p<0.01$).

Conclusion: Addition of dexmedetomidine to local anaesthetic agent in peripheral nerve block leads to decreased total consumption of analgesic postoperatively. Furthermore, in axillary brachial plexus block dexmedetomidine significantly prolonged both sensory as well as motor blockade and post operative pain relief.

Keywords: Axillary Brachial plexus block, Dexmedetomidine, Ropivacaine, Bupivacaine, Visual Analogue Scale

INTRODUCTION

Axillary approach of brachial plexus block provides excellent operating conditions for forearm and hand surgeries with less risk of major complications like pneumothorax or diaphragmatic paresis. This makes it suitable for emergency department and outpatient use. It is a safe technique with low cost and advantage of prolong postoperative analgesia.

Axillary brachial plexus block was given by perivascular technique and drugs were injected according to the group assigned after negative aspiration for blood. To avoid the tourniquet pain, intercostobrachial nerve was blocked on the upper middle aspect of arm.

Many drugs have been used as adjuvants to local anesthetic agents to prolong the duration of peripheral nerve blocks. Clonidine, a partial α_2 adrenoceptor

agonist has been reported to prolong the duration of anesthesia and analgesia during such blocks.¹⁻³ The $\alpha_2:\alpha_1$ selectivity of Dexmedetomidine is eight times that of clonidine and its high specificity for α_2 subtype makes it a much more effective sedative and analgesic agent.⁴

It has been reported to improve the quality of intrathecal and epidural anesthesia.⁵⁻⁸ Its use in peripheral nerve blocks has recently been described.⁹⁻¹¹

The present study is designed to evaluate the effect of Dexmedetomidine as an adjuvant to 0.5% Ropivacaine hydrochloride with 0.5% Bupivacaine hydrochloride insensory and motor blockade and post operative analgesia axillary brachial plexus block in hand and forearm surgery.

METHODOLOGY

The present study was a prospective randomized controlled study done among patients undergoing hand or forearm surgery in a tertiary care hospital of Surat, Gujarat. Patients undergoing Axillary Brachial plexus block for hand or forearm surgery of either sex, aged 18-60 years with ASA grade I, II and III were included in the study.

Exclusion criteria: Patients fulfilling any of the below criteria were excluded from the study.

- Local infection at site of injection.
- Patients on anticoagulant therapy.
- Patients with hypersensitivity to any study drugs.
- Patients with cardiovascular diseases like fixed cardiac output, valvular heart disease, conduction block.
- Patient with preexisting peripheral neuropathies, uncontrolled diabetes mellitus and pregnancy.
- Patchy or inadequate anaesthesia supplemented with general anaesthesia.
- Patient taking α_2 agonist and antagonist
- Not willing to give informed written consent.

Permission of institutional ethical committee of SMIMER, Surat, was obtained to conduct the study.

Thorough preanaesthetic evaluation of the patient was done by present history, past history of medical illness or operation, family history and history of drug allergy. General examination was carried out including general condition, temperature, pulse, blood pressure, respiratory rate, pallor, icterus, clubbing, lymphadenopathy, dehydration and oedema. Local examination of axilla for infective foci was done. Patient was assessed by MPG grading. Systemic examination of cardiovascular system, respiratory system, central nervous system and alimentary system was

done. Along with routine investigations like complete blood count, urine examination, random blood sugar, renal function test, coagulation profile, chest X-ray and ECG, specific investigations if required were done.

On preoperative visit, physical status was decided according to ASA standards. Procedure, type of anaesthesia and visual analogue scale (VAS) for the postoperative pain assessment were explained to all patients and informed written consent was taken. On previous night, Tablet Alprazolam 0.5mg was given to allay anxiety and patients were kept nil by mouth for 6-8 hours.

On the day of surgery, in recovery room written informed consent and nil by mouth status of patients were confirmed. Intravenous line was secured with 20G intravenous cannula in contra lateral arm with inj. DNS 4-5ml/kg/hr. Inj. Glycopyrolate (3 μ g/kg) and Inj. Midazolam (0.03mg/kg) I.M. were given as premedication 45min before surgery. Pulse, BP, SpO₂, Respiratory rate, Sedation score were recorded after 45min of premedication and considered as basal value.

Patients were randomly allocated by chit method into 2 groups of 30 patients each:

In Group 1 (Dexmedetomidine group), Inj. 0.5% Bupivacaine hydrochloride 20ml, Inj. 0.5% Ropivacaine hydrochloride 20ml and Inj. Dexmedetomidine (2 μ g/kg) were given.

In Group 2 (Control group), Inj. 0.5% Bupivacaine hydrochloride 20ml and Inj. 0.5% Ropivacaine hydrochloride 20ml were given.

In operation theatre, Pulse, BP, SpO₂, Respiratory rate, Sedation score were recorded. Again reassurance was given to the patient and the procedure was explained. Axillary brachial plexus block was given under all aseptic and antiseptic precautions by perivascular technique and drugs were injected according to the group assigned after negative aspiration for blood. To avoid the tourniquet pain, intercostobrachial nerve was blocked on the upper middle aspect of arm. All standard protocols of axillary brachial plexus block were observed.¹²

Sensory and motor score as well as level of sedation were monitored every 5 min up to 30 min, every 15min up to completion of surgery and post operatively 1 hourly interval for 6 hours, 2 hourly up to 18 hrs and then at 24 hrs and 48hrs. Postoperatively, when VAS \geq 4, inj. Diclofenac sodium i.m. was administered as rescue analgesia, time was noted and total dose was calculated upto 48hrs.

Complications of the brachial plexus block like systemic toxicity, neuropathy and side effect of study drugs like hypotension, bradycardia, nausea, vomiting

and respiratory depression were noted perioperatively.

Sensory blockade was assessed by three modalities. Pain (Pin Prick), Temperature (Alcohol wipe) and Touch (11 Point Scale). Motor Blockage by Lovett rating score, Sedation were assessed by Ramsay Score and Visual Analog Scale for Pain Relief were used.

RESULTS

Demographic data like age, sex, weight of patients and surgical characteristics like duration & type of surgery were comparable in both the groups ($P > 0.05$). Basal mean pulse rate, 86 ± 6.5 per minute in Group 1 and 86 ± 10.0 per minute in Group 2, were comparable in both the groups ($p > 0.05$).

More sedation (asleep but easily arousable - score 3) was observed intraoperatively as well as postoperatively upto 3hrs in dexmedetomidine group as compared to control group ($p < 0.01$). The time for mean onset of sensory block was 15.63 ± 2.74 minutes in Group 1 and 19.46 ± 2.16 minutes in Group 2 while for onset of motor block was 18.73 ± 2.98 minutes in Group 1 and 23.3 ± 2.36 minutes in Group 2. So onset time of sensory as well as motor block was faster in dexmedetomidine group as compared to control group ($p < 0.01$) but first sensory and then motor block was observed in both the groups.

Table 1: Postoperative visual analogue scale

VAS at time	Group 1	Group 2
2 hr	0	0
4 hr	0	0
6 hr	0	0
8 Hr	0	0
10 hr	0	0.1
12 hr	0	1
14 hr	0	4.5
18 hr	0.4	5.4
24 hr	5.2	6.6
48 hr	7.1	7

Table 2: Total analgesic requirement upto 48 hrs

Total Analgesia Required	Group 1 (%)	Group 2 (%)
75 mg	0	0
150 mg	0	0
225 mg	20 (66.70)	0
300 mg	10 (33.33)	1 (3.33)
375 mg	0	16 (53.33)
450 mg	0	13 (43.33)

The duration of motor blockade was significantly prolonged in Group 1 (22.33 ± 1.39 hrs) as compared to Group 2 (14.5 ± 1.27 hrs)

($p < 0.01$). Postoperative analgesia was assessed by visual analogue scale (VAS). VAS was comparable in immediate postoperative period upto 10 hrs but after that it became significantly higher in control group across the time. So dexmedetomidine ($2 \mu\text{g}/\text{kg}$) as an adjuvant to Inj. (0.5%) Bupivacaine hydrochloride 20ml + Inj. (0.5%) Ropivacaine hydrochloride 20ml in axillary brachial plexus block significantly prolonged both sensory as well as motor blockade.

Mean total analgesic requirement (inj. Diclofenac sodium) was significantly less in 48 hours after performing axillary block in Group 1 (250 ± 35.95 mg) as compared to group 2 (405 ± 42.24 mg) ($p < 0.01$).

DISCUSSION

Surgical pain is a universal phenomenon affecting all patients in the perioperative period. Apart from an agonizing sensory experience associated with it, acute pain has several deleterious effects on the physique and the psyche of the sufferer. An anticipation of these effects combine with a humanitarian urge to relieve pain, play a pivotal role in provision and optimization of postoperative analgesia.¹³ Analgesia during perioperative period is one of the mainstay of balanced anaesthesia, as uneventful postoperative periods make surgery comfortable.

Regional anaesthesia is a safe and effective alternative technique for upper or lower limb surgery. Various approaches of brachial plexus block are used from which axillary brachial plexus block is a commonly used anaesthetic technique for forearm and hand surgeries. Opioid, steroid, midazolam, magnesium sulphate, α -2 agonist- clonidine and dexmedetomidine can be used as an adjuvant to local anaesthetic agent to improve the quality and duration of peripheral nerve block as well as postoperative analgesia.

Recently α -2 adrenoreceptor agonists are being used for their sympatholytic, sedative, analgesic and anaesthetic properties. In present study, more selective α -2 agonist dexmedetomidine has been added to local anaesthetic agents for axillary brachial plexus block as dexmedetomidine is eight times more specific for α -2 adrenoreceptor with α -2: α -1 selectivity ratio of 1620:1, compared with 200:1 for clonidine, especially for the 2a subtype which makes dexmedetomidine more effective than clonidine for sedation and analgesia.¹⁴

Dexmedetomidine enhance central and peripheral neural blockade with local anaesthetic agents. α -2 adrenoreceptors located at the peripheral nerve endings produces analgesia by preventing norepinephrine release. In the present study, axillary approach of brachial plexus block has been selected because of its ease of administration, safety, reliability and accepted technique for forearm and hand surgery.

The results of the above studies were very well correlated with the present study. The total requirement of analgesic in first 48 hours was significantly less in dexmedetomidine group. So addition of dexmedetomidine to local anaesthetic agent in peripheral nerve block leads to decreased total consumption of analgesic postoperatively. This is of utmost importance in patients with a compromised renal and liver status.

CONCLUSION

Addition of dexmedetomidine to local anaesthetic agent in peripheral nerve block leads to decreased total consumption of analgesic postoperatively. Furthermore, in axillary brachial plexus block dexmedetomidine significantly prolonged both sensory as well as motor blockade and post operative pain relief.

REFERENCES

1. Singelyn FJ, Dangoisse M, Bartholomee S, Gouverneur JM. Adding clonidine to mepivacaine prolongs the duration of anaesthesia and anaesthesia after brachial plexus block. *Reg Anesth* 1992;17:148-50.
2. Duma A, Urbanek B, Sitzwohl C, Kreiger A, Zimpfer M, Kapral S. Clonidine as an adjuvant to local anaesthetic axillary brachial plexus block: A randomized, controlled study. *Br J Anaesth* 2005;94:112-6.
3. Popping DM, Elia N, Marret E, Wenk M, Tramèr MR. Clonidine as an adjuvant to local anaesthetic for peripheral nerve and plexus blocks: A meta-analysis of randomized trials. *Anesthesiology* 2009;111:406-15.
4. Virtanen R, Savola JM, Saano V, Nyman L. Characterisation of selectivity, specificity and potency of medetomidine as an alpha 2-adrenoceptor agonist. *Eur J Pharmacol* 1988;150:9-14.
5. Kanazi GE, Aouad MT, Jabbour-Khoury SI, Al Jazzar MD, Alameddine MM, Al-Yaman R, et al. Effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block. *Acta Anaesthesiol Scand* 2006;50:222-7.
6. Konakci S, Adanir T, Yilmaz G, Rezanko T. The efficacy and neurotoxicity of dexmedetomidine administered via the epidural route. *Eur J Anaesthesiol* 2008;25:403-9.
7. Yazbek-Karam VG, Aouad MA. Perioperative uses of dexmedetomidine. *Middle East J Anesthesiol* 2006; 18: 1043-58.
8. El-Hennawy AM, Abd-Elwahab AM, Abd-Elmaksoud AM, El-Ozairy HS, Boulis SR. Addition of clonidine or dexmedetomidine to bupivacaine prolongs caudal analgesia in children. *Br J Anaesth* 2009;103:268-74.
9. Esmaglu A, Yegenoglu F, Akin A, Turk CY. Dexmedetomidine added to levobupivacaine prolongs axillary brachial plexus block. *Anaesth Analg* 2010;111:1548-51.
10. Obayah GM, Refaie A, Aboushanab O, Ibraheem N, Abdelazees M. Addition of dexmedetomidine to bupivacaine for greater palatine nerve block prolongs postoperative analgesia after cleft palate repair. *Eur J Anaesthesiol* 2010;27:280-4.
11. Rancourt MP, Albert NT, Cote M, Letourneau DR, Bernard PM. Posterior tibial nerve sensory blockade duration prolonged by adding dexmedetomidine to ropivacaine. *Anesth Analg* 2012;115:958-62.
12. Cousins MJ., *Neural blockade in Clinical Anaesthesia and management Of Pain*, 3rd Edition, chapter 10, Page 345-360.
13. Sandip Sinha, Maitreyee Mukherjee, Sajib Chatterjee, et al: Comparative study of analgesic efficacy of ropivacaine with ropivacaine plus dexmedetomidine for paravertebral block in unilateral renal surgery. *Anaesthesia, Pain and Intensive Care*; 16 (1): 38-42.
14. Joana Afonso, Flavio Reis et al; Dexmedetomidine: current role in anaesthesia and intensive; *Revista Brasileira de Anesthesiologia*; 62(1): 1-17.

ORIGINAL ARTICLE

Comparative Study of Ropivacaine versus Ropivacaine with Clonidine for Caudal Analgesia in Paediatric Age Group Among Lower Abdominal and Lower Limb Surgery

Bhavna H. Sojitra¹, Divyang V. Shah², Arpan P. Patel³, Pragna N. Vachharajani⁴

Author's Affiliations: ¹Assistant Professor;²Associate Professor; ³Resident;⁴Professor & Head, Department of Anaesthesia, SMIMER, Surat, Gujarat

Correspondence: Dr. Bhavna H. Sojitra, Email: bhsojitra2002@gmail.com

ABSTRACT

Introduction: Clonidine, an α_2 adrenergic agonist, prolongs analgesia without significant respiratory depression. The analgesic action of epidurally-administered clonidine is due to stimulation of descending noradrenergic medullospinal pathways inhibiting the release of nociceptive neurotransmitters in the dorsal horn of spinal cord. The present study was done with the objective of assessing advantages of use of clonidine with Ropivacaine for caudal analgesia in paediatric age group among lower abdominal and lower limb surgery.

Methodology: A randomized controlled study consisted in two groups of thirty paediatric patients (1-10 years) each with lower abdominal and lower limb surgery was carried out at Department of Anaesthesia, SMIMER Hospital, Surat during Jan to Dec 2012. Total 60 patients were randomly allocated in two groups by chit method. In Group R patients Inj. Ropivacaine 0.25% (0.5 ml/kg) was given and in Group RC patients Inj. Ropivacaine 0.25% (0.5 ml/kg) + Inj. Clonidine 2mg/kg was given. Patients were assessed for pain Modified objective pain score and sedation assessed with Four Point sedation score.

Results: Mean age of patient was 4.77 ± 2.487 years in Group R and 5.37 ± 2.723 yrs in Group RC. Total Male:Female ratio was 9:1. Majority of patients were operated for congenital herniotomy (68.3%) followed by Hypospadiasis repair (16.6%). Mean modified pain score was measured at each hour postoperatively. It was higher at each level in Group R and this difference was statistically significant. The mean duration of analgesia was 7.17 hrs in Group R and 12.93 hrs in Group RC. This difference was also statistically significant (p-Value < 0.001).

Conclusion: From the study, it was concluded that the addition of clonidine $2\mu\text{g}/\text{kg}$ to single shot caudal block with Ropivacaine 0.25% prolongs the duration of postoperative analgesia while maintaining hemodynamic stability. Clonidine $2\mu\text{g}/\text{kg}$ is safe & effective adjuvant in caudal block for paediatric lower abdominal and lower limb surgery.

Keywords: Clonidine, Ropivacaine, Caudal block, Analgesia

INTRODUCTION

Pain is the most feared symptom in paediatric age group. The main difference in pain perception between children and adults is related to cognitive-evaluative component which develops throughout childhood and adolescence. Different local anaesthetic agent can be used for caudal block. Ropivacaine is newer local anaesthetic used for caudal block.

Caudal block is a well-accepted technique and proved to be a good alternative to general anesthesia in pediatric infra-umbilical surgeries. Caudal analgesia is an extradural block is notable for its simplicity,

safety and effectiveness. Its advantage is postoperative pain relief, early ambulence and early discharge. Usage of single local anesthetic agent via caudal route provides shorter duration of block¹ and requires often supplemental anesthetics. Ropivacaine, an amide local anesthetic, offers some advantages over bupivacaine e.g., less cardiac and neurological toxicity, less motor blockade and prolonged sensory analgesia.² Its main disadvantage is shorter duration of action after single shot injection (4 to 6hr). So, various drugs have been added to local anaesthetic to prolong the duration of analgesia. Addition of opioids and non opioids like adrenaline, clonidine, ketamine, benzodiazepine etc. are used along with local

anaesthetics. Opioids carry risk of post-operative respiratory depression, and ketamine has the potential of neurotoxicity if inadvertently injected intrathecally.³

Clonidine, an α_2 adrenergic agonist, prolongs analgesia without significant respiratory depression. The analgesic action of epidurally-administered clonidine is due to stimulation of descending noradrenergic medullospinal pathways inhibiting the release of nociceptive neurotransmitters in the dorsal horn of spinal cord.⁴ The analgesic effect of clonidine is more pronounced after neuraxial injection, which suggests a spinal site of action and makes this route of administration preferable.^{5,6}

The present study was done with the objective of assessing advantages of use of clonidine with Ropivacaine for caudal analgesia in paediatric age group among lower abdominal and lower limb surgery.

METHODOLOGY

A randomized controlled study consisted in two groups of thirty paediatric patients (1-10 years) each with lower abdominal and lower limb surgery was carried out at Department of Anaesthesia, SMIMER Hospital, Surat during Jan to Dec 2012.

After approval from the Institutional Ethics committee, the present study was conducted in 60 paediatric patients of either sex belonging to ASA grade I or II, in the age group 1 to 10 years scheduled for elective lower abdominal and lower limb surgery. Written Informed consent of the guardian was taken before enrolment of the patients in the study.

Detailed history and preoperative assessment was carried out a day before operation. A detailed general as well as systemic examination was done to rule out any major systemic illness. Routine investigation were carried out. Patients with drug allergy, skin infections at the site of block, abnormalities of sacrum, active central nervous system diseases, history of disorders of blood clotting, and patients with cardiovascular, respiratory, hepatic and renal diseases were excluded from the study.

Total 60 patients were randomly allocated in two groups by chit method. In Group R patients Inj. Ropivacaine 0.25% (0.5 ml/kg) was given and in Group RC patients Inj. Ropivacaine 0.25% (0.5 ml/kg) + Inj. Clonidine 2mg/kg was given.

Clonidine used in study was a preservative free preparation, available in 150mg/ml ampoules. All the patients were premedicated oral midazolam in sugar syrup 0.3mg/kg fourty-five minutes before surgery. General Anaesthesia was given thiopentone sodium 0.25% & suxamethonium 2mg/kg intravenously, intubation was done with appropriate size endotracheal tube. Anaesthesia was maintained with nitrous oxide

66% oxygen 33% along with isoflurane & vecuronium bromide as muscle relaxant. The duration of caudal analgesia was defined from the time of caudal injection to the time of the first analgesic supplementation. Respiratory depression was defined as an oxygen saturation <93%. Patients were assessed for pain Modified objective pain score and sedation assessed with Four Point sedation score. Side effects like nausea, vomiting, bradycardia, hypotension, urinary retention and respiratory depression were noted.

RESULTS

Mean age of patient was 4.77 ± 2.487 years in Group R and 5.37 ± 2.723 yrs in Group RC. Total Male:Female ratio was 9:1. Majority of patients were operated for congenital herniotomy (68.3%) followed by Hypospadiasis repair (16.6%). Heart rate, Arterial Blood Pressure, Mean Oxygen saturation and respiratory rate studied intra operative as well as post operative within normal limit or controlled. Analgesic consumption was significantly higher in Group R (206.50 ± 71.633 mg) when compared with Group RC (99.35 ± 147.854 mg) (p-Value <0.001). In the immediate post-operative period, sedation score was 2.47 ± 0.507 in Group R and 2.20 ± 0.407 in Group RC (p<0.05)

Table 1: Mean Modified pain score

TIME	GROUP R (Mean \pm SD)	GROUP RC (Mean \pm SD)	p-Value
1 hrs	0.30 \pm 0.466	0.07 \pm 0.254	0.019
2 hrs	1.20 \pm 0.925	0.37 \pm 0.669	<0.001
4 hrs	2.20 \pm 0.665	1.10 \pm 0.845	<0.001
6 hrs	2.97 \pm 1.273	1.90 \pm 0.403	<0.001
8 hrs	7.13 \pm 1.332	2.20 \pm 0.407	<0.001
12 hrs	6.10 \pm 0.923	4.40 \pm 2.711	0.002
18 hrs	5.63 \pm 0.809	4.57 \pm 1.135	<0.001
24 hrs	4.40 \pm 1.070	3.33 \pm 0.802	<0.001

Mean modified pain score was measured at each hour postoperatively. It was higher at each level in Group R and this difference was statistically significant. The mean duration of analgesia was 7.17 hrs in Group R and 12.93 hrs in Group RC. This difference was also statistically significant (p-Value < 0.001).

DISCUSSION

Caudal analgesia provides an excellent means of pain relief to children in the postoperative period. Prevention of pain is always easier than cure. Not providing adequate pain relief may lead to serious psychological upset in children. Early postoperative pain relief hastens the recovery and minimizes hospital stay. For outpatient surgery, agents that provide minimal side effects are essential.

Clonidine, an antihypertensive agent with sedative and analgesic effects is a mixed α_1 and α_2 adrenoceptor agonist with a predominant α_2 action. The analgesic action of epidurally administered clonidine is due to stimulation of descending noradrenergic medullospinal pathways inhibiting the release of nociceptive neurotransmitters in the dorsal horn of spinal cord. When given epidurally, in the dose of 1-2 $\mu\text{g}/\text{kg}$ body weight, it prolongs the duration of analgesia without any fall in heart rate, mean arterial pressure, respiratory depression and oxygen saturation. Synergistic effect of epidurally administered clonidine with ropivacaine, increases the duration of analgesia.

Several pediatric studies involving caudal use of clonidine together with local anesthetics have indicated a spinal mechanism of action.^{7,8} Co-administration of clonidine with local anesthetics has been shown to improve the quality of peripheral nerve blocks.^{9,10}

The present study shows that mean modified pain score was measured at each hour postoperatively. It was higher at each level in Group R and this difference was statistically significant. The mean duration of analgesia was 7.17 hrs in Group R and 12.93 hrs in Group RC. This difference was also statistically significant ($p\text{-Value} < 0.001$). Bajwa SJ *et al.*¹¹ found in a study that caudal block with ropivacaine 0.5 ml/kg combined with 2 $\mu\text{g}/\text{kg}$ of clonidine provides efficient analgesia intra-operatively and prolonged duration of analgesia post-operatively. Koul A *et al.*¹² also found significant prolongation of post-operative analgesia with an addition of clonidine with bupivacaine caudally.

CONCLUSION

From the study, it was concluded that the addition of clonidine 2 $\mu\text{g}/\text{kg}$ to single shot caudal block with Ropivacaine 0.25% prolongs the duration of postoperative analgesia while maintaining hemodynamic stability. Clonidine 2 $\mu\text{g}/\text{kg}$ is safe & effective adjuvant

in caudal block for paediatric lower abdominal and lower limb surgery.

REFERENCES

1. Verghese ST, Hannallah RS. Postoperative pain management in children. *Anesthesiol Clin North America*. 2005;23:163–84.
2. Habre W, Bergesio R, Johnson C, Hackett P, Joyce D, Sims C, et al. Pharmacokinetics of ropivacaine following caudal analgesia in children. *Paediatr Anaesth*. 2000;10:143–7.
3. Malinovsky JM, Lepage JY, Cosian A, Mussini JM, Pinaud M, Souron R. Is ketamine or its preservative responsible for neurotoxicity in rabbit? *Anesthesiology*. 1993;78:101–5.
4. Cook B, Dayle E. The use of additives to local anaesthetic solutions for caudal epidural blockade. *Paediatr Anaesth*. 1996;6:353–9.
5. Bonnet F, Boico O, Rostaing S, Loriferne JF, Saada M. Clonidine induced analgesia in post operative patients; epidural versus intramuscular administration. *Anesthesiology*. 1990;72:423–7.
6. Eisenach J, Detweiler D, Hood D. Haemodynamic and analgesic action of epidurally administered clonidine. *Anesthesiology*. 1993;78:277–87.
7. Kuthiala G, Chaudhary G. Ropivacaine : A review of its pharmacology and clinical use. *Indian Journal of Anaesthesia* 2011;55(2):104-10.
8. Sood J, Pant D, Koul A: Caudal Clonidine in Day- Care Paediatric Surgery. *Indian Journal of Anaesthesia* 2009; 53(4):450-454.
9. El Saied AH, Steyn MP, Ansermino JM. Clonidine prolongs the effect of ropivacaine for axillary brachial plexus blockade. *Can J Anaesth*. 2000;47:962–7.
10. Ivani G, Conio A, de Negri P, Eksborg S, LoEnnqvist PA. Spinal versus peripheral effects of adjunct clonidine: Comparison of the analgesic effect of a ropivacaine-clonidine mixture when administered as a caudal or ilioinguinal-iliohypogastric nerve blockade for inguinal surgery in children. *Paediatr Anaesth*. 2002;12:680–4
11. Bajwa SJ, Karun J, Bajwa SK, Bakshi G, Singh K, Panda A. Caudal ropivacaine-clonidine: A better post-operative analgesic approach. *Indian J Anaesth*. 2010;54:226–30.
12. Koul A, Pant D, Sod J. Caudal Clonidine in Day-Care Paediatric Surgery. *Indian J Anaesth*. 2009;53:450–4.

ORIGINAL ARTICLE**Adolescent Sexuality: Perceptions, Preferences and Practices**Shailee Vyas¹, Mohua Moitra², Vipul Chaidhary²**Author's Affiliations:** ¹Assistant Professor;²Associate Professor; Dept. of Community Medicine, Government Medical CollegeSurat, Gujarat**Correspondence:** Dr Shailee N Vyas, Email:shaileenvyas@gmail.com**ABSTRACT****Introduction:** Adolescence is a transitional stage of physical and mental development between childhood and adulthood. This is a large, heterogeneous and vulnerable group who will be adults tomorrow and drive the economy. Thus adolescents need to be cared for.**Objectives:** To document perceptions, preferences and practices of adolescents related to sexual health. To explore if any difference exists among these adolescents according to their external environment.**Methods:** A cross sectional study. A total of 600 participants were selected purposively; 450 college going (professional and general stream college) and 150 out of college adolescents.**Results:** Majority (43.6% college going and 27.3% out of college) ignored their sexual desires; followed by masturbation (21.5% college students); watching pornography (28.2% out of college students); intercourse (11.8% college going students and 12.7% out of college adolescents). Premarital acceptability was highest for kissing (81.8% college and 63.3% out of college). Premarital coitus was acceptable among 16.9% college going and 13.3% out of college adolescents. Majority of the respondents said that people who had premarital sex, should get married; this attitude was found to be significantly higher ($p=0.0001$) in the professional college students. Homosexuality was not acceptable to majority of the respondents (70.9% college and 76% out of college).**Conclusions:** Acceptance and exposure to premarital sex exposes the vulnerability in this group which is compounded by the absence of formal counselling and friendly treatment services. High level of unacceptability of homosexuality highlights the challenges faced in mainstreaming homosexuality and prevention of discrimination.**Keywords:** adolescents, sexual desire, sexual practices, homosexuality**INTRODUCTION**

The word "ADOLESCENC" is derived from the Latin word *adolescere* meaning "to grow up". It is a transitional stage of physical and mental development that occurs between childhood and adulthood.¹ Today 1.2 billion adolescents stand at the crossroads between childhood and the adult world. Around 243 million of them live in India. This accounts for nearly one quarter of the total population². Moreover, Adolescent Reproductive and Sexual Health (ARSH) has been identified as a key strategy in the Reproductive and Child Health (RCH-II) program under the National Rural Health Mission (NRHM)³. In the light of the above mentioned scenario and the fact that today's adolescents will be tomorrow's adults comprising the productive group of the community and thus will influence the overall growth of the country, investing in adolescents would be a "demographic dividend", this study is an endeavour to gather some

baseline information about adolescents specially of Surat city which will help in determining their current perceptions, preferences and practices related to sexual health

AIMS AND OBJECTIVES

The study was conducted with following objectives:

To document perceptions, preferences and practices of adolescents related to sexual health.

To explore if any difference exists among these adolescents according to their external environment.

METHODOLOGY

Study design: It was a Cross-sectional study.

Sampling: Considering the sensitive nature of the topic, a purposive sampling technique was selected to ensure sincere support, participation and compliance from the study participants.

Study setting: The study has two groups – college going and out of college.

College going adolescents were approached from the three purposively selected colleges (one professional college (150 students) and two general stream colleges (300 students)).

The out of college cohort (150 adolescents) was approached through the NGO, NIWCD (National Institute for Women and Children Development) situated at Surat city. This NGO played a key role in recruiting the study participants. These participants were the one enrolled with this NGO.

Inclusion Criteria:

College going cohort: All adolescents belonging to Age group between 17 and 19 years, willing to participate in the study, Studying in one of the three selected colleges

Out of college cohort: Adolescents capable of answering the self-administered questionnaire and currently not studying

Study Tool: A pre-designed and pretested semi structured questionnaire which was self-administered under supervision

Data Collection Methodology: Prior to the filling up of proforma, the adolescents were gathered in small groups (15-20 for out of college and 30-40 for college going) and were briefed about the significance of the study. They were assured about the anonymity of their responses. Then each question was explained to them and then asked to fill them one by one under close monitoring of the investigator. Any query while filling up the questionnaire was solved immediately. Sitting arrangement of the participants was designed so as to ensure privacy during filling up of the questionnaire, to avoid biased answers and ensure confidentiality.

Data Management and Analysis: Data entry was done in Microsoft Excel software and analysis was done by Epi_info version 6.04 software.

Ethical considerations:

Ethical approval was obtained from the institutional ethical committee.

The participants were explained regarding the study and their informed consent was obtained prior to data collection.

RESULTS

In this study, majority of the study population were Hindus (91.6% in college and 69.3% in out of college group) followed by Muslim 5.8% and 22% in college going and out of college groups respectively and rest belonged to other religions. A higher proportion of Muslims were seen in the out of college group as this group was selected purposively from the outreach service area covered by the NGO which was approached for this study.

In this study (table: 1), ignoring sexual urges was the commonest response and was documented in 31.3% of out of college students compared to 46.9% among college students. Out of the students who took some active measures to satisfy one's own sexual urges, masturbation (21.5%) was the commonest first preference among the college going students compared to watching pornography (28.2%) among the out of college students. Quite a few (12.8% college going, 14.8% out of college; 11.4% general stream students & 12.6 % professional college students) accepted to indulge in actual physical intercourse as the first thing to satisfy their sexual desire. More of boys (58.6%) in the professional college group and girls (24.6%) in the out of college group considered masturbation as their first option to satisfy sexual desire. Also Professional College boys opted for masturbation in almost double proportion as compared to boys of other General Stream Colleges (58.6% and 19.9% respectively).

As is evident from the table:2, kissing was the most acceptable premarital sexual relationship followed by fondling, although the acceptability sharply drops to 40% for fondling as compared to 80% for kissing. Changing times is reflected when we see that premarital coitus is acceptable among 16.9% college going and 13.3% out of college adolescents. Majority, still believed that people who indulged in premarital sexual relations should marry. On the contrary, a sizable number (36% college going and 28.7% out of college) also believed that it was okay, if people who had premarital relationship did not get married. However, when intra-college analysis was done, this acceptability is significantly higher ($p=0.0001$) in the professional college students.

Acceptability of almost all the variables pertaining to premarital sexual relations was found to be the highest in the male respondents of the professional college except for coitus which was found to be highest (26.3%) in the male students of the general stream college. The general stream students (78.5%) were more traditional as compared to professional college students (32.9%) while responding that when there is a premarital sexual relationship, then the consenting adults should get married. This difference in the attitude was significant ($p=.0001$)

Table 1: Distribution of study population according to their first preference to satisfy own sexual desires

	College			Out of College		
	Male (%) n = 211	Female (%) n = 208	Total (%) n = 419	Male (%) n = 68	Female (%) n = 61	Total (%) n = 129
Masturbation	75(35.5)	17(8.1)	89(21.5)	18(26.5)	15(24.6)	33(25.7)
Actual Sexual Intercourse	36(17.1)	17(8.1)	53(12.8)	10(14.7)	9(14.7)	19(14.8)
Pornography	41 (19.5)	37 (17.9)	78 (18.8)	25 (36.7)	11 (18.1)	36 (28.2)
Ignore (p value: 0.02; df=2)	59(27.9)	137(65.9)	196(46.9)	15(22.1)	26(42.6)	41(31.3)

Table 2: Distribution of the study population according to their perception of premarital sexual relations

	College			Out of College		
	Male (%) n = 226	Female (%) n = 224	Total (%) n = 450	Male (%) n = 73	Female (%) n = 77	Total (%) n = 150
Perception of premarital sexual relation						
Kissing Acceptable*	186(82.3)	182(81.3)	368(81.8)	61(83.6)	34(44.2)	95(63.3)
Fondling Acceptable	123(54.4)	60(26.8)	183(40.7)	47(64.4)	14(18.2)	61(40.7)
Coitus Acceptable	58(25.7)	18(8.0)	76(16.9)	11(15.1)	9(11.7)	20(13.3)
Perception of need to get married in case of premarital sexual relation						
Should get married	144(63.7)	144(64.3)	288(64.0)	54(74.0)	53(68.8)	107(71.3)
No need to get married	82(36.3)	80(35.7)	162(36.0)	19(26.0)	24(31.3)	43(28.7)

*p value : 0.0001; df:1

Table 3: Practices of the study population about sexual issues

	College			Out of College		
	Male (%) n = 226	Female (%) n = 224	Total (%) n = 450	Male (%) n = 73	Female (%) n = 77	Total (%) n = 150
Knows anyone of same age with sexual experience						
Knows	138 (61.1)	115 (51.3)	253 (56.2)	42 (57.5)	34 (44.2)	76 (50.7)
Doesn't know	88 (38.9)	109 (48.7)	197 (43.8)	31 (42.5)	43 (55.8)	74 (49.3)
Own sexual experience						
Kissing (p value: 0.0001; df=2)						
Yes	55 (24.3)	60 (26.8)	115 (25.6)	45 (61.6)	22 (28.6)	67 (44.7)
No	171 (75.7)	164 (73.2)	335 (74.4)	28 (38.4)	55 (71.4)	83 (55.3)
Fondling						
Yes	34 (15.0)	24 (10.7)	58 (12.9)	27 (37.0)	6 (7.8)	33 (22.0)
No	192 (85.0)	200 (89.3)	392 (87.1)	46 (63.0)	71 (92.2)	117 (78.0)
Coitus (p value: 0.0001; df=1)						
Yes	13 (5.8)	11 (4.9)	24 (5.3)	22 (30.1)	9 (11.7)	31 (20.7)
No	213 (94.2)	213 (95.1)	426 (94.7)	51 (69.9)	68 (88.3)	119 (79.3)

Table 4: Perception of the study population about homosexuality

	College v/s out of college			Inter college		
	College	Out of college	Total	General Stream	Professional college	Total
Acceptable	131 (29.1)	36 (24.0)	167 (27.8)	96 (31.3)	35 (24.5)	131 (29.1)
Not acceptable	319 (70.9)	114 (76.0)	433 (72.2)	211 (68.7)	108 (75.5)	319 (70.9)

When asked as a proxy question of their own sexual practices(as described in table 3), if they knew of anyone of their age group who had sexual experience, majority (61% males & 51% females in college and 57.7% males & 44.2% females in out of college) responded affirmatively. But when asked about their own sexual practices, this number came down drasti-

cally - 25.6% college & 44.7% out of college for kissing, 12.9% college & 22% out of college for fondling, 5.3% college & 20.7% out of college for coitus). The point to note that even in the first interaction 5.3% of college going and 20.7% of out of college going adolescents accepted being sexually active which reiterates the urgent need for adolescent friendly health

services in India. It was interesting to note that the overall self reporting of sexual practices was more commonly seen among the out of college adolescents. However, there was a significant difference in this declaration, with girls reporting drastically less numbers than boys in the out of college group.

In this study, when asked how many people with preference for same sex partners were known to them, half (51.3%) responded as none, 35.3% did not know, 8.9% respondents knew 1 to 10 such people & rest 4.4% respondents knew more than 10 such people in the college group. While in the out of college group, 45.3% did not know followed by 42.7% respondents knew none, 9.3% knowing 1 to 10 such persons & rest 2.7% knowing more than 10 such persons. Similar pattern was seen within the two colleges. Almost half in both the colleges (50.2% in General Stream College, 53.8% in Professional College) did not know anyone who preferred same sex partners. But more 13.6% general stream and 12.6% professional college students knew someone with preference for same sex.

Among those who knew at least one such person, boys outnumbered girls (19.5% boys in college going and 20.5% in out of college group as compared to 7.1% and 3.9% girls in both the groups respectively ; 19.2% and 20% boys and 8% and 5.5% girls in general stream and professional stream colleges respectively.)

Maximum number of adolescents from the professional college (7.7%) revealed about knowing more than 10 persons with preference for same sex compared to 2.9% in general stream and 2.7% in the out of college adolescents.

Further as described in table 4, on asking, how they perceived homosexual relations, majority in all the groups answered that it was unacceptable (70.9% in college & 76% in out of college group, 68.7% in General Stream College and 75.5% in Professional College).

DISCUSSION

It was observed in this study that for majority of the adolescents (31.3% of out of college students compared to 46.9% among college) ignoring sexual urges was the commonest response and was documented in students. This was closely followed by indulging in masturbation for 21.5% college going and 28.2% out of college adolescents. In their study, S Ramadugu et al reported that 45.9% boys and 12.7% girls indulged in masturbation.⁴

Majority in our study still believed that people who indulged in premarital sexual relations should marry. At the same time, quite a few (36% college going and 28.7% out of college) were of the opinion that it was

okay, if people who had premarital relationship did not get married. These results were quite higher compared to the results reported by Jaya et al in their study which said that only 4.4% of adolescents were okay with the idea of sexual relationship not followed by marriage.⁵

When asked as a proxy question of their own sexual practices if they knew of anyone of their age group who had sexual experience, majority (61% males & 51% females in college and 57.7% males & 44.2% females in out of college) responded affirmatively. These numbers fell dramatically when asked about their own sexual practices (25.6% college & 44.7% out of college for kissing, 12.9% college & 22% out of college for fondling, 5.3% college & 20.7% out of college for coitus) and this self-reporting of sexual practices was more commonly seen among the out of college adolescents. It was also observed that girls reported drastically less numbers than boys in the out of college group. Similar findings were reported by P Patel et al where only 25 % of boys admitted that they had watched pornography. Around 42 % boys and 38 % girls had girl/boyfriends and 24 % and 12 %, respectively had experienced vaginal intercourse first with a neighbour or relative of same age.⁶ Similar premarital sexual experiences have been reported by Leena Abraham - 12.6% for girls and 49.3% for boys⁷; Sathe and Sathe - 22% of boys and less than 5% girls⁸; NFHS 3 - 4% of young women and 15% young men⁹; Kumar et al - 21.7% males and 4.6% females.¹⁰

CONCLUSIONS

Although majority of the adolescents across all the groups ignored their sexual urges quite a few did accept actual intercourse as their most preferred method of dealing with their sexual desires. This exposes the vulnerability in the group in the absence of formal counseling and friendly treatment services. Sizable number of adolescents used pornography (which includes MMS) as their preferred mode to gratify their sexual desires was worrisome as it might result in victimization. More than half the respondents in both groups accepted to knowing some one of their age who was sexually experienced. In contrast to this, very few adolescents revealed their own sexual experience and different studies have reiterated the existence of premarital sexual experiences from different parts of the country, which reaffirms the need for formal information sharing in relation to sexual health in this age group and the absence of adolescent friendly health services makes this group vulnerable. Homosexuality was not acceptable to majority of the respondents. This reflects the challenges faced in mainstreaming homosexuality and prevention of discrimination.

LIMITATIONS

Considering the sensitive nature of the topic, purposive sampling technique was used to conduct the interviews. Thus the findings cannot be extrapolated to the general population.

Limitation of time did not allow for more in depth research.

REFERENCES

1. Adolescence. Available at: <http://en.wikipedia.org/wiki/Adolescence>. Accessed on 31/05/2010
2. UNICEF, India Country Office. Adolescence – An age of opportunity. New Delhi, India. UNICEF; 2011. p – 1.
3. Secondary analysis of data from National Family Health Surveys of India - 1, 2, 3 (1992-2006) for the age group 15-24 years. New Delhi: GOI, MOHFW. UNAIDS/WHO; 2009. [Last accessed on 2010 Mar 05]. WHO/ MOHFW. Reproductive and Sexual Health of Young People in India. Available from: http://mohfw.nic.in/NRHM/Documents/RSH_of_YP_in_India.pdf.
4. Shabsikumar Ramadugu et al. Understanding sexuality among Indian urban school adolescents. *Industrial Psychiatry Journal*; Jan-Jun 2011; Vol 20; Issue 1
5. Jaya, Michelle J. Hindin. Premarital Romantic Partnerships: Attitudes and Sexual Experiences of Youth in Delhi, India. *International Perspectives on Sexual and Reproductive Health*; Volume 35, Number 2, June 2009
6. CHETNA and Society for Operations Research and Training. Small Research Grants Report No. 10. Knowledge, Awareness, Belief and Practice on Sexuality and Reproductive Health of Adolescent in Slums of Ahmedabad. Patel P, Capor I, Joshi U, Barge S, Uttekar V. Ahmedabad, India. December 2000
7. World Health Organization. Bott S, Jejeebhoy S, Shah I, Purl C, editors. Risk behaviour and misconceptions among low-income college students of Mumbai; Abraham I; Towards Adulthood: Exploring the sexual and reproductive health of adolescents in South Asia. Geneva; 2003.p.73-7
8. Sathe AG, Sathe S. Knowledge and behaviour and attitudes about adolescent sexuality amongst adolescents in Pune: A situational analysis. *J Fam Welfare*. 2005;51:49-59
9. International Institute for Population Sciences (IIPS) and Macro International, 2007. National Family Health Survey (NFHS-3), 2005-06, India: Key Findings. Mumbai : IIPS. Available from: <http://www.measuredhs.com/pubs/pdf/SR128/SR128.pdf>, accessed on August 17, 2012.
10. Kumar GA, Dandona R, Kumar SG, Dandona L. Surveillance of premarital sex among never married young adults in a high HIV prevalence district in India. *Behavioral AIDS Behav* 2011; 15 : 228-35.

ORIGINAL ARTICLE

Study of Prevalence of Histopathological Lesions in Lung at Autopsy

Smita Jhaveri¹, Swati Dudhatra²**Author's Affiliations:** ¹Associate Professor; ²Resident; Department of Pathology, SMIMER, Surat, Gujarat, India**Correspondence:** Dr. Smita Jhaveri, Email: drsmitajhaveri@gmail.com

ABSTRACT

Background: In present days, the air pollution and other environmental inhallants, chemical cum toxic substances become uncontrollable, so, the lungs are involved by inflammatory as well as occupational disease. Lungs are also involved in all cases of terminal events due to cardia vascular disease. Thousands of people around the world suffer from preventable lung lesions . The clinical and radiological findings in respiratory diseases are nonspecific and prompt histopathological study is essential. Autopsies are carried out to establish cause of death of the person along with previous antemortem history, investigations and other imaging studies to rule out lung lesions. This study also helps prevalence of pulmonary lesions load in community.

Aims & Objectives: This study was carried out with the objective to study prevalence of different pulmonary lesions in autopsy that are confirmed by histopathological examination.

Methodology: The retrospective study of 200 lung specimens received at autopsy was carried out in the Department of Pathology, SMIMER, Surat. Gross findings and microscopic features were recorded. The tissue specimens were processed and examined microscopically.

Results: A total of 200 lungs from autopsy specimens were studied. Lung diseases are more common in males as compared to females. Most common lung pathological findings are of congestion/oedema/changes interstitium/pulmonary haemorrhage (68.5%), pneumonia (17.5%), tuberculosis (3.5%) followed by other inflammatory lesions (fungal/other granuloma) (4%) and emphysema (1.5%) among the cases studied.

Conclusion: Advances in diagnostic technology have not reduced the value of autopsy and a goal directed autopsy remains a vital component for the study and evaluation of the disease process. Autopsy is an important tool in identifying and understanding of lung disease that helps in evaluation of outcome as well as gives clue for prevention of the same. It also helps to reduce prevalence of lung disease in society by educational counselling as well as periodic medical checkups.

Keywords: autopsy, tuberculosis, pneumonia, interstitial lesions, ARDS

INTRODUCTION

The spectrums of lung lesions include congestion, oedema, various inflammatory lesions, chronic obstructive pulmonary diseases and neoplastic lesions. Lungs are also secondarily involved in almost all form of terminal events due to cardio vascular causes.^{1,2,3} Clinical history, laboratory investigations and imaging studies give supportive information but prompt pathological diagnosis is required for confirmation along with prognosis of the disease. This avoids the patient from more invasive procedures.⁴ It is important to determine the leading causes of death that helps to take preventive actions which are less expensive for prevention of progressive lung disease and avoid the need of invasive procedure i.e. lung biopsy.⁵

The main aim of autopsy is to study the pathology of

different organs after death to determine the cause of death and prevalence of various organ lesions that gives clue to the diseases burdening the society. It helps for prophylactic actions to be taken.⁶ In our study, the lungs were studied grossly & histopathologically. Gross pathologic examination of autopsy lungs gave information regarding status of lung, i.e. collapsed or hyper inflated, congestion, presence of firm to hard areas with tubercles and necrosis, fibrosis, bullae, consolidation, nodules, infarction, secretions, abscess formation and also provides information regarding status of bronchi and pleura (thickening and nodule formation) which provides hint to the diagnosis. Different histopathological patterns in lung specimen were studied along with gross findings in consideration to know the cause of morbidity and mortality.

METHODOLOGY

Sample size: Retrospective study of lung specimens of 200 routine autopsies were carried out in Autopsy Section, Department of pathology, SMIMER, Surat to find out the prevalence of various pulmonary lesions at autopsy.

Methods: The study included all autopsy subjects irrespective of age, sex & cause of death. Both Lungs were examined grossly for colour, weight, volume (collapsed or inflated), consistency, areas of fibrosis, oedema, congestion, abscess formation, bullae, cavitary lesions, status of bronchi and pleura (thickening and nodule formation). The sections were taken from representative areas. Biopsy sections from both lungs were processed, 4 to 5 micron thickness sections were take and stained with Haematoxylin and Eosin stain and examined microscopically. Ziehl Neelson stain and Period Acid Stain were also done wherever required. The findings were noted. As this study was retrospective from autopsy section, so no seperate permission of ethical committee was asked.

RESULTS

Sex wise distribution of the lung lesions are shown in

table 1.

Among all the cases, 84% were males and 16% were females. Both sexes showed a high incidence of congestion/oedema/interstitial inflammation, i.e. 68.5% followed by 17.5% cases of pneumonia. i.e the second most common cause in this study. Tuberculosis lesions were seen in 7 cases, out of which 4 were males and 3 were females. Terminal event such as emphysematous change was found in 3 cases, all of which were males. ARDS was found in 2 cases only, No malignant lesions were found in the study. 7 cases showed autolytic changes and only 1 case was of normal lung.

The age wise distribution of the cases are shown in Table No. 2.

Cases of congestion/oedema/interstitial inflammation were more commonly found in age group of 31 to 60 years. Cases of pneumonia were commonly found in age group of 31 to 45 years. Case of tuberculosis and other granulomatous lesions were commonly found in the age group of 31 to 45 years. Emphysematous changes were found in the age group of 46 to 60 years. A low incidence of ARDS was found in two age groups, i.e. between new born to 15 years and in 46 to 60 years group.

Table 1: Sex wise distribution of lung lesions (n = 200)

Lesion	Male (%)	Female (%)	Total (%)
Congestion/Odema/Changes in Interstitium/ Pulmonary Haemorrhage	118 (59.0)	19 (9.5)	137 (68.5)
Pneumonia	30 (15.0)	5 (2.5)	35 (17.5)
Tuberculosis	4 (2.0)	3 (1.5)	7 (3.5)
Other Inflammatory Lesion (Fungal/Other Granuloma)	4 (2.0)	4 (2.0)	8 (4.0)
Emphysematous Changes	3 (1.5)	0	3 (1.5)
ARDS	1 (0.5)	1 (0.5)	2 (1.0)
Malignant Lesion	0	0	0
Autolysed	7 (3.5)	0	7 (3.5)
Normal Morphology	1 (0.5)	0	1 (0.5)
Total	168 (84.0)	32 (16.0)	200 (100)

Table 2: Age wise distribution of lung lesions (n=200)

Lesion	0-15 yrs (%)	16-30 yrs (%)	31-45 yrs (%)	46-60 yrs (%)	>60 ys (%)
Congestion/Odema/Changes in Interstitium/ Pulmonary Haemorrhage	5 (2.5)	27 (13.5)	45 (22.5)	45 (22.5)	15 (7.5)
Pneumonia	3 (1.5)	4 (2.0)	15 (7.5)	9 (4.5)	4 (2.0)
Tuberculosis	0	1 (0.5)	3 (1.5)	1 (0.5)	2 (1.0)
Other Inflammatory Lesion (Fungal/ Other Granuloma)	1 (0.5)	1 (0.5)	4 (2.0)	0	2 (1.0)
Emphysematous Changes	0	0	1 (0.5)	2 (1.0)	0
ARDS	1 (0.5)	0	0	1 (0.5)	0
Malignant Lesion	0	0	0	0	0
Autolysed	0	0	2 (1.0)	2 (1.0)	1 (0.5)
Normal Morphology	0	1 (0.5)	0	0	0
Total	10 (5.0)	34 (17.0)	70 (35.0)	62 (31.0)	24 (12.0)

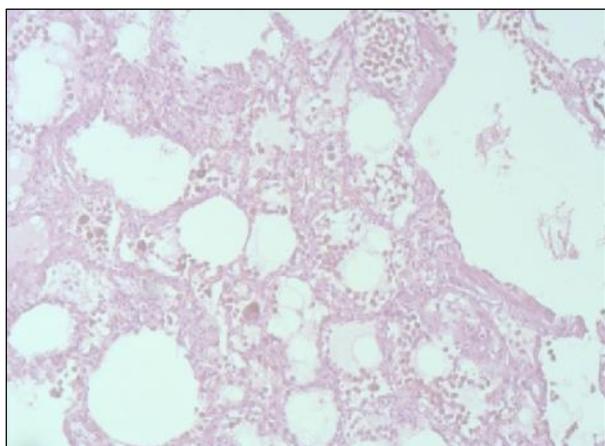


Figure 1 : Micrograph of Chronic Venous Congestion

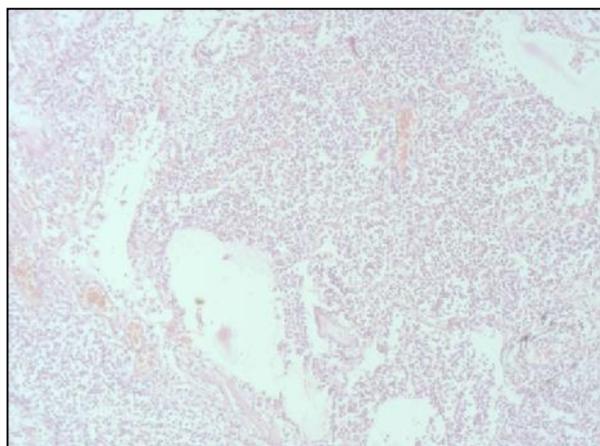


Figure 2: Micrograph of pneumonia (Neutrophilic exudate into the alveoli)

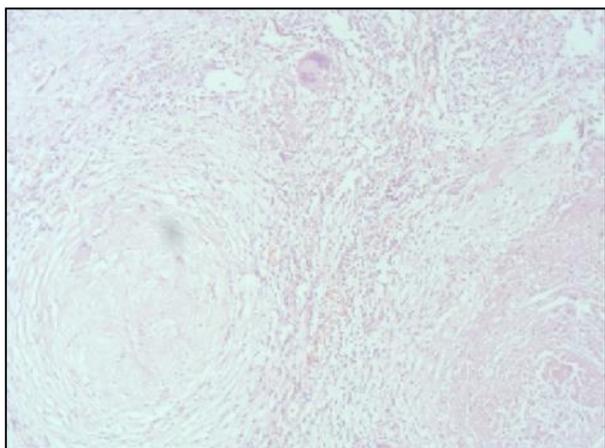


Figure 3 : Micrograph of Tuberculosis

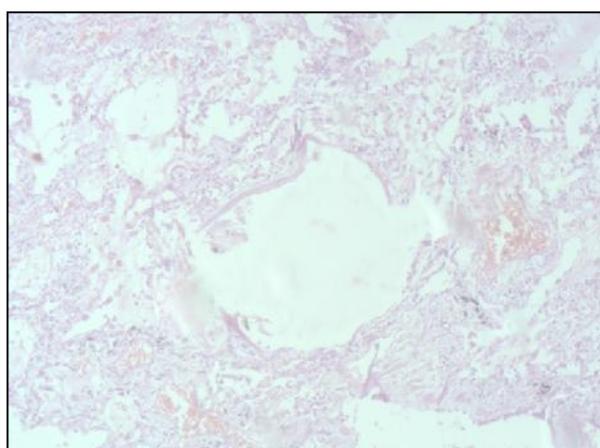


Figure 4. Micrograph of ARDS

DISCUSSION

The present study was compared to the other similar study. In the present study, males were more commonly affected than females. That was comparable to the study by Rupali et.al.⁷ Selvambigai et. al.⁸ Puneet et. al.⁹ Chauhan et.al.¹⁰. The terminal events include congestion/oedema/changes in interstitium/pulmonary haemorrhage. Terminal events are one of the most common findings in the various studies. Our present study findings were comparable to Chauhan et. al, Rupali et.al.⁷, and Puneet et. Al⁸.

In present study, pneumonia was found second most common lung lesion and our findings were comparable to Chauhan et. al and Rupali et.al. In our study, the occurrence of Tuberculosis was comparable to Rupali et.al and somewhat comparable to Chauhan et.al. In our study, the occurrence of ARDS was comparable to Rupali et.al and Pratima et.al.¹¹ Majority of lung lesions in our studies were of terminal events. These changes due to pollution, smoking, any restrictive lung disease leading to fibrosis and cardiovascular disease.

In present study, there was a very low prevalence of ARDS i.e. 1% which was also comparable by study

done by Sachdev et.al.¹² where there were 125 lung autopsy cases over a period of 3 years and Manjeet et.al also showed low prevalence of ARDS. In this study, majority of the cases were found in the age group of 31 to 60 years which was comparable to study done by Selvambigai et.al. which was 20 to 50 years and Rupali e.al which was also 20 to 50 years.

LIMITATIONS

The limitation of the study was the non receipt of the whole organ or representative sample at the time of autopsy, which if overcome will set much higher standard of autopsy reporting and would be a more useful tool in understanding cause of death.

CONCLUSION

From present study of autopsy specimens of lungs, the most common findings were terminal events, pneumonia and tuberculosis. We should plan to prevent the causes and reduce the prevalence of preventable lung lesions. All the factories and industries should take care of their respective employees for

periodic medical checkup, educational counselling should be given on exposure of environmental pollutants to the people.⁸ As majority population of our study was 30 to 60 years age group that were working people.

Despite recent advances in diagnostic technology, autopsy has endured as a vital complementary tool of recognising and understanding chronic respiratory diseases. It also serves as reassuring and educative tool in identifying and establishing the underlying cause of death. Autopsy study is of great value in refining the vision and diagnostic setup for better clinical evaluation. Histomorphological study of lung in autopsies may quite often disclose common diseases affecting lungs and their relative contribution towards death.⁷

REFERENCES

1. Manjit S Bal, PS Sethi, Anil K Suri, Vijay K Bodal, G Kaur. Histopathological pattern in lung autopsies, *jpafmat* 2008; 8(2):29-31
2. Jhon E Hall. *Guyton and Hall Textbook of Medical Physiology*, 13th Edition, Elsevier: Saunders; 2015.
3. Kumar Abbas, Aster, Robbins, Cotran. *Pathologic basis of disease*, South Asia Edition 9, Vol 2. Elsevier; 2014.
4. Kasper, Fauci, Hauser, Longo, Jameson, Loscaizo. *Harrison's principles of internal medicine*, 19th ed. Vol 2, Mc Graw Hill; 2015.
5. Ghosal R, Kloer P, Lewis KE. A review of novel biological tools used in screening for the early detection of lung cancer. *Postgraduate Medical Journal* 2009; 85: 358-63
6. KS Naranay Reddy, OP Murty. *The essentials of Forensic Medicine and Toxicology*, 33rd edition. JayPee Brothers;2014.
7. Rupali Ramrao Kurawar, Maya Suresh Vasaikar. Spectrum of histomorphological changes in lungs at autopsy: A 5 year study. *JMSCR*. 2017; Vol 5. Issue 12 : pp 31304-30308
8. Selvambigai G., Amudhavalli S., Deepak Chakravarthi C.D, Ravi S. Histopathological study of lung in autopsy cases:a prospective study. *IJRMS*. 2016; Vol 4, Issue 11:pp 4816-19
9. Puneet Garg, Aradhana Sharma, Ramesh kumar Kundal. Spectrum of Pulmonary Histopathological Lesions : A study of 100 autopsy cases. *JMSCR*.2017; Volume 5, Issue 12.
10. Chauhan G, Madhuri Agrawal, Niral Thakkar, Bharti Parghi. Spectrum of histopathological lesions in lung autopsy. *KRMDS*. 2015; Vol 3 Issue 2 : pp 109-12
11. Pratima Khare, Renu Gupta, Mukta Ahuja, Nupur Khare, Swapnil Agarwal, Deepti Bansal. Prevalence of Lung Lesions at Autopsy : A Histopathological study. *JCDR*. 2017; Vol 11, Issue 5, pp EC13 - EC16
12. Sachdev S, Pandit SP. Acute respiratory distress syndrome: an autopsy study. *J Postgrad Med Edu Res*. 2014;48(1):8-13

ORIGINAL ARTICLE**Fine Needle Aspiration Cytology of Lymphnode in HIV Positive Patients and Its Correlation with CD4 Count****Sudha Jain¹, Smita Jhaveri¹, Ameekumari Patel²****Author's Affiliations:** ¹Associate Professor; ²Resident; Department of Pathology, SMIMER, Surat, Gujarat, India**Correspondence:** Dr. Smita Jhaveri, Email: drsmitajhaveri@gmail.com**ABSTRACT**

Background: AIDS is a fatal disease with many opportunistic infections. Causes of lymphadenopathy are opportunistic infections or lymphoid malignancy. FNAC is useful tool for the diagnosis of reactive lymphadenitis, acute suppurative lymphadenitis and opportunistic infections in HIV. There is a correlation between CD4 and FNAC findings. There is low CD4 count in reactive hyperplasia, suppurative lymphadenitis & granulomatous inflammation & very low count in lymphoma and Kaposi's sarcoma.

Aims & Objectives: To find out the pathological changes such as infections, benign and malignant lesions in the lymph nodes of HIV positive patients by FNAC and to establish a correlation between clinicopathological findings, FNAC & CD4 count.

Methodology: The study of 100 patients was carried out in the Department of pathology, SMIMER Medical College, Surat. FNAC of the lymph nodes were performed and smears were stained by Giemsa, H&E, PAP & ZN stains to rule out fungus & AFB. CD4 count of the same patients were performed.

Results: Out of 100 patients, maximum cases of 31 to 40 years (32%) with M:F of 2:1. cervical LNs (77%) with findings of Tuberculous lymphadenitis (70%), reactive hyperplasia (12%) & Lymphoma (5%) cases. Lymphoma were associated with severe reduction of CD4 count (66 to 145).

Conclusion: Incidence of infectious lesions was higher (76%) with maximum number of patients were of Tuberculous lymphadenitis with CD4 count range of 200 to 499 and cases of lymphoma were associated with CD4 count (66 to 145).

Keywords: AIDS, CD4, lymphnode, tuberculosis, lymphoma

INTRODUCTION

AIDS was first recognized in the United States in the summer of 1981. In 1983, human immunodeficiency virus (HIV) was isolated from a patient with lymphadenopathy, Gia Carangi was a supermodel and one of the first famous women to die of HIV/AIDS¹. In 1985, a sensitive enzyme-linked immunosorbent assay (ELISA) was developed, which led to an appreciation of the scope and evolution of the HIV epidemic at first in the United States and other developed nations and ultimately among developing nations throughout the world².

AIDS is a fatal illness that breaks down body's immunity and leaves the victim vulnerable to life threatening opportunistic infections, neurological disorders or unusual malignancies.³ In India the Human Immunodeficiency Virus (HIV) epidemic is now emerged as one of the most serious public health problems in our country.⁴ Lymphadenopathy

may also be a manifestation of opportunistic infections, lymphoid malignancy developing in a immunocompromised individual. Fine needle aspiration cytology (FNAC) can serve as an alternative method and may be practiced for the diagnosis of reactive lymphadenitis, acute suppurative lymphadenitis and opportunistic infections in HIV/ AIDS viz. tuberculosis, histoplasmosis, toxoplasmosis and malignant conditions such as kaposi sarcoma, and lymphoma.⁵

There is a correlation between CD4 count and FNAC findings. It is seen that there is a general downward trend in mean CD4 count from reactive hyperplasia or suppurative lymphadenitis to granulomatous inflammation and further very low count in lymphoma and Kaposi's sarcoma.

The present study was designed to find out the pathological changes such as infections, benign and malignant lesions in the lymph nodes of HIV positive patients by FNAC; to establish a correlation be-

tween clinico-pathological findings and FNAC findings; and to establish a correlation of fine needle aspiration cytological findings with the CD4 count.

METHODOLOGY

Sample size: This is prospective cross-sectional observational study comprises a total of 100 patients. This study was carried out in the Department of Pathology, SMIMER Medical College, Surat during the period June 2012 to October 2013. All the patients enrolled in study were evaluated and few of them were followed in a prospective manner over a period of 17 months.

Patient’s source: The cases directly coming to an out patient department of medical or surgical departments as well as indoor patients referred from the other departments with cervical and axillary lymphadenopathy who were vitally stable.

Patient reactive for ELISA test of HIV, patients with cervical and axillary Lymphadenopathy of > 1 cm size and vitally stable patients were included in the study.

Methods: FNAC of the lymph nodes were performed and 5-6 smears were immediately kept in fixative (methanol), at least 2 wet smears were stain for H & E stain and 2 air dried smear for Giemsa stain and rest smears were kept unfixed for any special stain like PAP Stain, Zeil-Neelsen(ZN) stain for AFB and PAS stain for fungi if required. The smears were kept in methanol for 15 min for fixation. Then they were allowed to dry and staining was carried out.

Calculation of CD4 count: All the 100 seropositive patients included in this study were then sent to Antiretroviral Therapy (ART) centre in SMIMER Hospital, Surat for CD4 cell count testing. They collect

the blood & send the Blood to the ART center of Civil Hospital, Surat for the CD4 count. The procedure done for CD4 count is FACS (fluorescence activated cell sorter count system) caliber method.

Collection & transport of blood for CD4 count:

Label the collection tube with the date, time of collection, and a unique patient identifier/name, age & sex. The whole blood collected in EDTA was sent to the laboratory within six hours. The test was done within 48 hours of collection of blood.

RESULTS

The prospective cross sectional observational study of fine needle aspiration cytology of lymphadenopathy conducted between 2012 to 2013 at Department of Pathology, SMIMER Medical College, Surat.

The Range of age of patients was from 4 month-70 years with median age of 35 .The incidence of lymphadenopathy decreased with advancing age after 50 years. The male to female ratio was approx 2:1.

Table 1: Age distribution

Age(years)	No.
0-10	8
11-20	10
21-30	24
31-40	32
41-50	17
51-60	7
61-70	2
Total	100

Table 2: FNA Cytology Of Lymphnode Finding In HIV Patients (n=100 cases)

Lesion	No.	Axillary	Cervical
Acute suppurative lymphadenitis	6	2	4
Benign lympho-epithelial lesion	2	0	2
Reactive hyperplasia	12	2	10
Tuberculous lymphadenitis	70	14	56
Lymphoma	5	0	5
Cystic swelling	1	0	1
Keratinous cyst	1	0	1
Metastatic deposit	3	0	3

Table 3. Lymphoma Diagnosis

	CD4 count	No. of Lymphnode	Splenomegaly
Anaplastic large cell lymphoma	145	Single	Y
Large cell lymphoma	104	Multiple	N
Non Hodgkins lymphoma	78	Single	Y
Hodgkins lymphoma	66	Multiple	Y
Diffuse large cell lymphoma	98	Multiple	N

Table 4. Correlation Of CD4 Range & Cytological Diagnosis By FNAC Of Lymphnode

CD4 range	Median CD4 count	Cytological diagnosis	Number diagnosis
116-520	338	Acute suppurative lymphadenitis	6
121-1162	641.5	Benign lympho-epithelial lesion	2
119-670	313	Reactive hyperplasia	12
49-640	210	Tuberculous lymphadenitis	70
66-145	98	Lymphoma	5
336	336	Cystic swelling	1
223	223	Keratinous cyst	1
78-360	105	Metastatic deposit	3

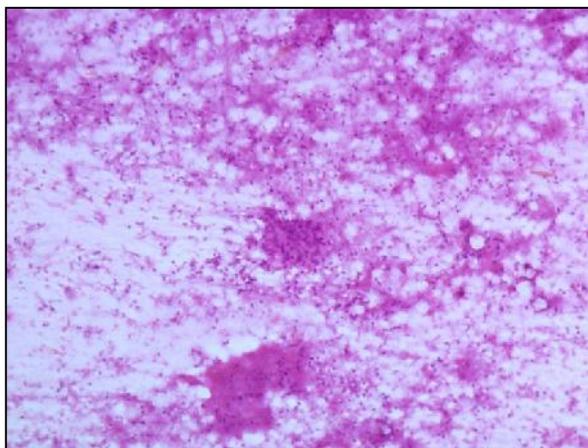


Fig 1: Tuberculous Lymphadenitis (H&E, 10X)

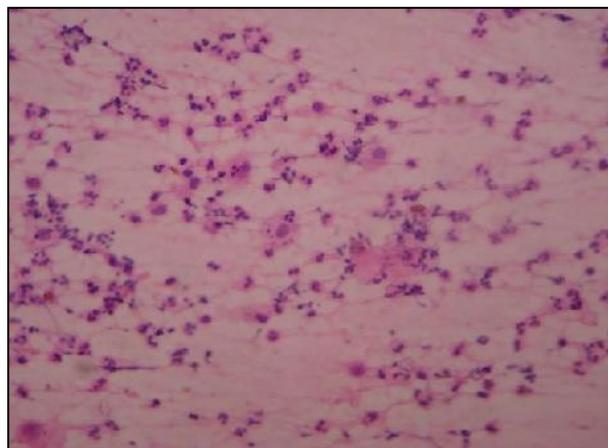


Fig 3: Suppurative lymphadenitis. (H&E, 40X)

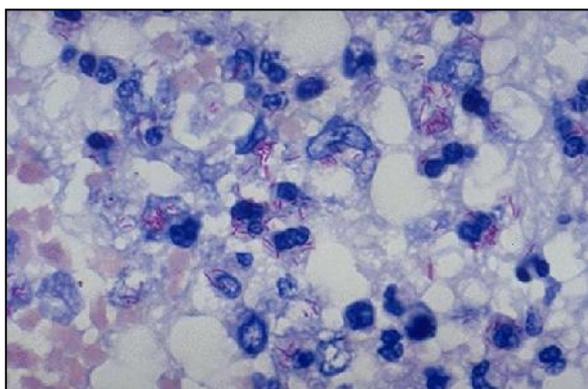


Fig 2: Numerous AFB on ZN stain. (100x)

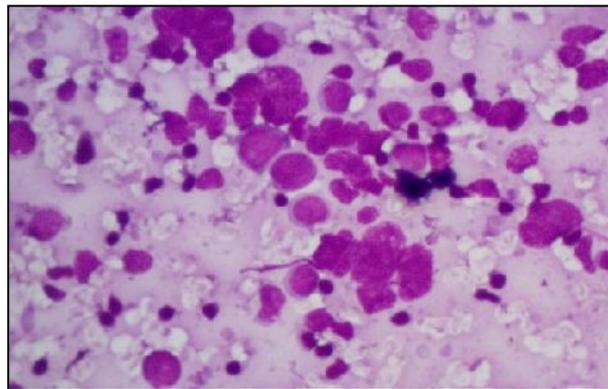


Fig 4: Cytological features of large cell lymphoma. (H&E 40X)

DISCUSSION

The fine needle aspiration cytology is a recent, world wide accepted, non hazardous, practically non invasive, inexpensive and diagnostically fairly accurate method. It has been proved that the reliability and accuracy of FNAC is very high in experienced hands. Out of 100 aspirates, cytological diagnosis of infectious, benign and malignant was given in 76%, 16% and 8% respectively. The most common cytological diagnosis was infectious 76% and tuberculosis was the most common etiology found among infectious disease.

The age range of the patient varied from 4 months to 70 years. Majority of the patients were in the age group 31-40 years (32%) followed by 21-30 years (24%). Similar findings were recorded by Amit et al⁹.

Similar findings were recorded by Guru et al. on 231 cases of lymphadenopathy in HIV positive patient. Majority of patients were of age group 21-40 years. In similar study by Vanisri et al.⁷ on 36 cases of lymphadenopathy in HIV positive patients 44.4% cases were recorded in age group of 21-30 years closely followed by 31-40 years (25%). In the present study, males (66%) were affected more commonly than female (34%), male: female ratio was 2.16:1. Similar findings were reported by Amit et al. in which males (59.2%) were affected more commonly than female (31.66%), male: female ratio was 2.16:1, Guru et al.⁶ in which it was 2.3:1, Parikh et al.⁸ it was 3.44:1. In the present study the maximum number of patient presented with cervical lymph node enlargement 77% which correlates with Amit et al. 280 (93.4%),

Guru et al (78.76%), Parikh et al (62.5%), and many others like Vanisri et al, and Bates et al.

In the present study 76(76%) cases were diagnosed cytologically as infectious, non-neoplastic 16(16%) and 8(8%) as neoplastic, which was comparable with Parikh et al. while in Amit et al benign lesion were higher. In our study 70% were of tubercular lymphadenitis, which was comparable with vanisri et al had 58.3% , rest study had lower incidence of tuberculous lymphadenitis as compare with our study. In present study, 6% in suppurative lymphadenitis, which was comparable with Desmukh et al. had 6.81%. In the present study among Benign lesions cytologically diagnosed, maximum number of cases, were 12% in reactive lymphadenitis group In the study of desmukh et al. 29.5% were in the reactive lymphadenitis group.

Among neoplastic lesions, in our study the most common was lymphoma 5% followed by metastatic deposit in 3%. Similar results were seen in above mentioned studies. Shenoy et al. and Vanisri et al. also did not found any other opportunistic infection. Bates et al. Noted one case of *Histoplasma* and one case of *Cryptococcus*. Satyanarayan et al. noted one case of *Cryptococcus* and one case of *Rhodotorula*. Tuberculous lymphadenitis was predominant cytopathological diagnosis in the present study constituting 70% cases. Studies conducted by Shenoy et al (50%) in Mangalore, Guru et al¹ (41.55%) in Chadigarh and Amit et al. 114 (38%) in Rajkot also observed tuberculous lymphadenitis as a common lymph node lesion. However studies conducted in California by Bottles et al¹¹ (17%) and in Europe by Reid et al¹² (15%) and Martin-Bates et al¹¹ (22%) demonstrated lower number of cases in comparison with recent study. In total 70 cases of tuberculous lymphadenitis on FNAC, Ziehl Neelsen stain was done. Out of which 50(71.42%) cases were positive for AFB and 20(28.53%) were negative. While in Amit et al. 53(46.33%) cases were positive for AFB and 61(53.51%) were negative. And rate of AFB positivity was reported by Ahmed et al¹⁵ (46.4%) in 2005. Metre and Geeta Jayaram (1987) demonstrated acid fast bacilli in 56.4% of tuberculous lymphadenitis.

In present study among tuberculous lymphadenitis patients CD4 range was 49-640 and median CD4 count was 210 while in Shobhana et al. CD4 range was 143-422 while median CD4 count was 212 which comparable with present study. There was low CD4 count range 66-145 in lymphoma patient, while in Shobhana et al. two cases had lymphoma having CD4 count 79 and 113 respectively which correlates with present study. CD4 count more than 500 cells/ μ L was seen in 10 (6%) cases of tuberculous lymphadenitis in our study. Patients with tubercular infection had CD4 count between 200- 499 cells/ μ L in 30 (42%) cases and less than 200 in 30 (42%) cases

which was correlates with Desmukh et al. shows 55% and 45% accordingly. In total 70 cases of tuberculous lymphadenitis 52.85 % had Epitheloid granuloma with caseation, 20% had granuloma without caseation, 27.14% had only caseous necrosis, which is comparable with Rajshekharan et al. subsequently 37.5%,37.5% and 25% and Desmukh et al. subsequently 50%, 15% and 35%.

In total 70 cases of tuberculous lymphadenitis CD4 counts were available in all 70 cases. The mean CD4 cell count was 210. Similar findings were recorded by Sobhana et al¹⁷ with median CD4 count 212, Amit et al. 261.8 .Guru et al. ⁵ recorded mean CD4 count of 123.8 in tuberculous lymphadenitis. In total 12 cases of reactive lymphadenitis CD4 counts were available in all 12 cases. The mean CD4 count in our study was 313 which is comparable with Guru et al⁵ with CD4 count 311.4, Amit et al. 285.4. Shobhana et al.¹⁷ found slightly higher value(672)of median CD4 count for reactive lymphadenitis.

In metastatic malignancies CD4 count available in all 3 cases. The mean CD4 count was 105. Guru et al.⁵ recorded mean CD4 count of 105. Similarly in Lymphoma lesions CD4 count available in all 5 cases and the mean CD4 count was 98 which is comparable with Amit et al. 153.5. Sobhana et al.¹⁷ found CD4 count in only two cases of NHL which were of 79 & 113.

CONCLUSION

The maximum numbers of cases were in the age group of 31-40yrs. The Range of age of patients was from 4 month-70 years with median age of 35.

The incidence of lymphadenopathy decreased with advancing age after 50 years.

The male to female ratio was approx 2:1.

Most common region involved in study was cervical 77% followed by axillary region 18 % while both region 5 %

Incidence of infectious lesion 76% was higher in present study While in 8 cases malignancy were found.

Maximum number of patients were having tuberculous lymphadenitis (70%) followed by reactive lymphadenitis were found in 12 patients followed by acute suppurative lymphadenitis in 6 patients. While in lymphoma all 5 cases and metasatic deposit 3 cases all having cervical lymphadenopathy Also there had 2 cases of benign lymphoepithelial lesion and each case of keratanious cyst and cystic swelling found on cytology.

We found 5 cases of lymphoma each showing cytological features of anaplastic large cell lymphoma, large cell lymphoma, non hodgkins lymphoma, hodgkins lymphoma, & diffuse large cell lymphoma having CD4 count of 145, 104, 78, 66, & 98 subsequently. Out of them Anaplastic large cell lympho-

ma, diffuse large cell lymphoma & hodgkins lymphoma were confirmed histopathologically. While in other 2 cases histopathology was not available.

Maximum number of malignant cases were found in 3rd decade.

Out of 100 cases, CD4 count ≥ 500 seen in 16 patients, 200-499 in 42 patients, while < 200 were seen in 42 patients.

In tuberculous lymphadenitis(70 cases), the median CD4 count was 210 (49-640); acute suppurative lymphadenitis(6 cases), the median CD4 count was 338 (116-520), reactive lymphnode (12 cases), the median CD4 count was 313 (119-670), lymphoma (5 cases), the median CD4 count was 98 (66-145), metastatic deposits (3 cases), median CD4 count was 105 (78-360) & benign lymphoepithelial lesion (2 cases), the median CD4 count was 641.5 .

REFERENCES

1. Longo, Fauci.Harrison's Textbook of Internal Medicine. 18th ed. McGraw Hill Professional. 2011. pp 1506-1587
2. Kumar V,Abbas AK., Fausto N.disease of immunity, Robbins and cotran Pathologic basis of Disease,7th Edition, Elsevier publication.2007.245-258.
3. Joshi PL, Rao JV. Changing epidemiology of HIV / AIDS in India. AIDS Res Rev.1999;2:7-9.
4. Shobhana A, Guha SK, Mitra K, Dasgupta A, Negi DK, Hazra SC. People living with HIV infection/AIDS: A study on lymphnode FNAC and CD4 count. Indian J Med Microbiol. 2002;2:99-101.
5. Kumar Guru, M.H.Kulkarni, M.S.Kamakeri; FNAC of peripheral lymphadenopathy in HIV positive patients. Scientific medicine. 2009. Vol 1. Issue 2. pp 16-19
6. Vanisri H.R., Nandini N.M., Sunila R. Fine Needle Aspiration Cytology Findings in Human Immunodeficiency Virus Lymphadenopathy. *Indian J. Pathology & Microbiology*. 2008 Vol 51. Issue 4. pp 481-484.
7. Parikh U.R., Goswami H.M., Nanavati M.G., Bisen V.V., Patel S., Menpara C.B., Yadav K.S., Shah P.K., Mehta N.P., Gosai R. N., Dignostic utility of FNAC in HIV positive lymphadenopathy. Journal of clinical research letters. 2012.vol.3. issue 2. pp 16-19
8. Amit Agravat, Hardik Sanghvi, Gauravi Dhruva. Fine needle aspiration cytology study of lymphnode in HIV patients and CD4 count. Int J Res Med. 2013. Vol 2 Issue 2. pp16- 19
9. Deshmukh A.T.,Jagtap M. W.2, Nomaan Nafees- Cytological Evaluation of Lymphadenopathy in HIV Patients. International Journal of Recent Trends in Science And Technology, ISSN 2277-2812 E-ISSN 2249-8109, Volume 6, Issue 3, 2013 pp 125-129
10. Kaushal R. Bhojani, Garg R.Study of cytological findings in Human immunodeficiency syndrome virus Lymphadenopathy. International Journal of Current Biological and Medical Science 2011; 1(4):140 -142
11. Orell S.R., Sterret G.F., Walters M.N., Whitakar D. Manual and atlas of fine needle aspiration cytology, Edition 4. Churchill Livingston. 2005.
12. Gray Winfred. Diagnostic cytopathology. Edition 3. Churchill Livingston. 2010.

CASE REPORT

Venlafaxine as an Augmentation of Electro- Convulsive Therapy in Treatment Resistant Depression- A Case Report

Abhinav Joshi¹

Author's Affiliations: ¹Medical Officer, Institute of Mental Health, Singapore

Correspondence: Dr. Abhinav Joshi, E-mail: drabhinavjoshi@gmail.com

ABSTRACT

Treatment of challenging cases of Depression with or without psychotic features often needs use of Electro-convulsive Therapy at some stage. The purpose of this case report is to demonstrate the effectiveness of augmentation of Electro-convulsive Therapy, in treatment of a case of Resistant Depression with antidepressant medication, Venlafaxine. Though further research is needed to confirm that with ongoing Electro-convulsive Therapy, changing the antidepressant classes, SSRI or NaSSA to Venlafaxine will improve the recovery rate.

Keywords: Treat resistant depression, Psychotic Depression, Electroconvulsive therapy in Depression, Venlafaxine in Treatment Resistant Depression.

INTRODUCTION

Treatment Resistant Depression has always been a challenge for the Mental Health Providers. Treatment Resistant Depression can be defined as an inadequate response to at least one antidepressant trial of adequate doses and duration. In this case we attempt to describe a patient who was unresponsive to maximum dosage of antidepressant and was started on Electro Convulsive Therapy, but without an expected response. Then we see how starting Venlafaxine actually made her recovery faster.

CASE REPORT

A 62 year old Indian Lady, she was brought by her family for change in her behaviour for the past few months. She had become socially withdrawn, was refusing food and had a clingy behaviour towards her family. At times she would get aggressive and physically hit her sister. In January 2013, her family noticed that she was refusing food, water and her medications. Her family pointed out her symptoms to a few events, when she was following up with a doctor for Hyponatremia and was scolded by the doctor a few times that she would die if she does not reduce her water intake. She was reviewed by a Psychiatrist and was started on Mirtazapine. According to the family she responded well to Mirtazapine. But the family defaulted treatment, until she started getting worse.

After her admission, she was noticed to be scared of strangers and wanted her family members to be on

her side all the time. She denied any persecutory ideations or suspiciousness towards the strangers. She was noticed to be crying most of the time and was not forthcoming about what was stressing her. She was started on Mirtazapine which was up-titrated over the course of one month to 45 mg/day. She was also started on Quetiapine 200mg/day. In consideration of her poor response to medications, she was started on Electro Convulsive Therapy. But even after six sessions of Electro Convulsive Therapy she was not responding as was expected. So Mirtazapine was stopped and she was started on Venlafaxine up-titrated to 150mg/day, while the Electro Convulsive Therapy was on. She started responding to this treatment and was discharged stable after 10 sessions of Electro Convulsive Therapy and within 15 days of starting Venlafaxine.

DISCUSSION

Anti-depressant – ECT combination was found to be more effective than medication or ECT alone. Similarly ECT was needed in the above mentioned case as the patient was refusing feeds and was not a good candidate for psychological intervention. In case patient has been tried on maximum dosage of anti-depressant and also augmented with other modalities such as antipsychotics or lithium, it is preferable to give a trial of ECT which can be further augmented with Venlafaxine if there is inadequate response. A study by Gonzalez-Pinto et al¹, showed 10 of 13 (76.9%) patients, were considered responsive to combined ECT-Venlafaxine treatment,

though the positive responses were not associated with venlafaxine. Another study by Neirenberg et al² showed that, Venlafaxine is effective for a significant, but small, minority of patients with rigorously defined triple-resistant depression. Venlafaxine dose and cardiac function has to be monitored in view of possible cases of arrhythmias/asystole as well as interaction with anesthetic agents. In conclusion, augmentation of ECT with Venlafaxine is an effective approach in Treatment Resistant Depression but will require close monitoring of cardiac function and medication dosage, especially in elderly population.

REFERENCES

1. Ana Gonzalez-Pinto, M.D. Miguel Gutierrez, M.D. Nekane Gonzalez, M.D. Edorta Elizagarate, M.D. Jose L. Perez de Heredia, M.D. Juan A. Mico, M.D. Efficacy and Safety of Venlafaxine-ECT Combination in Treatment-Resistant Depression. *J Neuropsychiatry Clin Neurosci.* 2002 Spring;14(2):206-9.
2. Nierenberg, Andrew A. MD; Feighner, John P. MD; Rudolph, Richard MD; Cole, Jonathan O. MD; Sullivan Joanne MA. Venlafaxine for Treatment-Resistant Unipolar Depression. *J Clin Psychopharmacol.* 1994 Dec;14(6):419-23.