International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 06, 2020
ISSN: 1475-7192

FETAL CEREBROPLACENTAL RATIO AT TERM PREGNANCY AS A PREDICTOR OF ADVERSE PERINATAL OUTCOME

*[1]Kirti Singh, [2]Neema Acharya, [3]Priyanka Singh, [4]Suresh V Phatak

ABSTRACT--*The middle cerebral artery (MCA) Doppler accuracy for predicting fetus at risk of wellbeing is not known properly. The study's objective is to is to evaluate the middle cerebral artery Doppler accuracy for predicting adverse fetal outcome. For studying perinatal outcome in pregnancy at term with normal cerebroplacental ratio,to study perinatal outcome in pregnancy at term with abnormal cerebroplacental ratio,to compare between the perinatal outcomes in pregnancy at term with normal and abnormal cerebroplacental ratio. A cross sectional study including 1000 pregnant women at term between 37 to 40 weeks of gestation. CPR (Pulsatility index of MCA and PI of UA) were calculated of all patients on USG Doppler. Abnormal CPR were related to bad fetal outcome.* 1000 *women will be studied. The obstetric intervention rate for suspected fetal distress will be higher among cases with lower CPR compared to those with normal CPR. A significantly higher rate of adverse perinatal outcome will be found in fetuses with CPR < 10^{th} percentile compared to those with CPR ≥ 10^{th} percentile. Data will show, low risk term pregnancies with reduced CPR has association with more risk of obstetric intervention because of fetal distress and bad fetal outcomes. Earlier detection of low CPR can be helpful in predicting adverse perinatal outcomes.*

Keywords--*Cerebroplacental ratio, perinatal outcome*

I. INTRODUCTION

As obstetricians, we are health experts providing tertiary care in MCH (maternal and child health) services. Apart from safe motherhood, we are equally responsible for good perinatal outcome. Preterm birth and fetal growth restriction are leading causes of adverse perinatal outcome.Both these entities are well studied and management protocols for them are well established in clinical practice.When placental function is not optimum fetal hypoxia and fetal growth restriction (FGR) can occur.

In cohort of AGA(appropriately grown) fetuses who have circulatory changes causing major risk for stillbirth and in neonate, a much greater risk of neurological morbidity [1,2]as well as heart diseases and other metabolic diseases in late life[3,4]Early detection of these circulatory changes can predict adverse perinatal outcome and improve MCH care. With the advances in ultrasound and color doppler in obstetrics, fetal

[1]**Junior Resident, Dept of Obgyn, JNMC, DMIMS(Deemed University), contact.kirtisingh@gmail.com, 9535619328*

[2] *Professor, Dept of Obgyn, JNMC, DMIMS(Deemed University), neemasacharya@gmail.com, 9326692511*

[3] *Junior Resident, Dept of Obgyn, JNMC,DMIMS(Deemed University), priyanka.singh044@gmail.com ,9307737878*

[4] *Professor, Dept of Radiodiagnosis, JNMC,DMIMS(Deemed University), suresh_phatak@yahoo.com, 9960571260*

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

cerebroplacental ratio (CPR) is a non-invasive investigation which is the ratio of PI of middle cerebral artery (MCA) to PI of umbilical artery (UA). It measures both compromised placental function and fetal circulatory adaptations [5]. CPR is known to evaluate bad perinatal outcomes better than its individual components [6] and it is better than conventional anthropometric models [7] .

With above background, in present study we aim to evaluate role of Cerebroplacental ratio(CPR) as a predictor for bad perinatal outcome in term pregnancies as important screening tool in MCH care.

II. RATIONALE

. The Cerebroplacental ratio in obstetric Doppler for prediction of the fetus at risk of compromise of wellbeing is an emerging method as the present research has been inconclusive. The objective of this study is to study the normal and abnormal CPR values for predicting adverse perinatal outcome [8].

III. OBJECTIVES

1- To study perinatal outcome in pregnancy at term with normal cerebroplacental ratio.

2- To study perinatal outcome in pregnancy at term with abnormal cerebroplacental ratio.

3- To compare between the perinatal outcomes in pregnancy at term with normal and abnormal cerebroplacental ratio.

IV. METHODS

Study Design: A cross sectional observational study

Duration of Study:2018-2020

Place of Study:Department of OBGYN ,AVBRH, Datta Meghe Institute of Medical Science Wardha

Sample Size: 1000

Materials-

Inclusion criteria**:** Low risk term pregnant women

Exclusion criteria**: 1)** Pregnant women preterm/post term **2)** All high risk pregnant women

The research will be conducted in department of obstetrics and gynecology and department radiology.Cerebroplacental ratio will be done for low risk antenatal women at term attending obstetrics OPD of AVBRH.Antenatal study group women having normal CPR will be assigned to group 1(women with normal CPR) and abnormal assigned to group 2(women with abnormal CPR).Study group women will be followed till discharge from hospital.Following variables will be studied as outcome measures.(1) Antenatal fetal outcome:FGR, FHR (<110/min or 110-160/min or >160/min), still birth(2) Intrapartum fetal outcome:

Mode of delivery, FHR, Still birth, Meconium stained liquor, APGAR Score, NICU admission(3) Neonatal outcome:NICU admission

Data will be entered in predesigned proforma.Data will be analyzed for comparison between two groups using appropriate statistical method.CPR is evaluated by doppler sonography. Abnormal flow will be analyzed and compared to adverse pregnancy and neonatal outcomes.Abnormality will be diagnosed based on C/U ratio

assessment. According to Arbeille, Values below 1.1 will be reported as abnormal.Following parameters are analyzed: birth weight, meconium-stained liquor, the mode of delivery like caesarean section frequency will be assessed. Afterwards, course of pregnancy and the newborn's status will be correlated with abnormal Doppler results. Data will be entered in a predesigned proforma. Statistical analysis will be done by using chi square test. The softwares used in the analysis will be SPSS 17.0 and Graphpad Prism 5.0 and P less than 0.05 will be considered as Level of significance.

V. EXPECTEDOUTCOMES/RESULTS

Overall, 1000 women will be included. The obstetric intervention rate will be more among cases with reduced CPR when compared to those with normal CPR . Increase rate of adverse perinatal outcome will be found in fetuses with CPR $< 10^{th}$ percentile compared to those with CPR $\geq 10^{th}$ percentile. Fetuses with less CPR wiil show a significantly higher rate of APGAR.

VI. DISCUSSION

Placenta is the source for metabolic as well as oxygen supply to the fetus. When placental supply to the fetus is diminished, fetal hypoxia and fetal growth restriction can occur.. In third trimester, this can be a major risk factor for stillbirth and in neonate, there are more risk of neurolopsychiatric[9] and neurodevelopmental morbidity for longer term.

A number of articles related to this study and associated conditions were reviewed (10-34). Few studies in this geographic context were also explored(35-74). CPR is used for monitoring growth restricted fetuses and abnormal CPR is an early sign of compromised fetus. This study will show increase rate of obstetric intervention and adverse outcome perinatally in women with abnormal CPR. Accuracy of CPR and MCA Doppler in predicting prognosis compared to UA doppler will be studied. The prognostic accuracy of CPR will be statistically superior to UA Doppler for emergencies for fetal distress and adverse fetal outcome. In conclusion, our results on low risk patients will suggest that a reduced CPR has more risk of instrumental deliveries and caesarean section, abnormal APGAR score, more intrauterine death. Thus, early detection of abnormal CPR can help in preventing adverse outcomes.

REFERENCES

1. E. Blair, F.J. Stanley, Intrapartum asphyxia: a rare cause of cerebral palsy,J. Pediatr. 112 (1988) 515e519.
2. N. Badawi, J.J. Kurinczuk, J.M. Keogh, L.M. Alessandri, F. O'Sullivan, P.J. Pemberton, F.J. Stanley, Antepartum risk factors for newborn encephalopathy：the western australian case-control study, Br. Med. J. 317 (1998)1549.
3. D.J. Barker, C. Osmond, J. Golding, D. Kuh, M.E. Wadsworth, Growth in utero,blood pressure in childhood and adult life, and mortality from cardiovasculardisease, Br. Med. J. 298 (1989) 564.
4. J. Eriksson, T. Forsen, J. Tuomilehto, C. Osmond, D. Barker, Fetal and childhoodgrowth and hypertension in adult life, Hypertension 36 (2000) 790e794

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

5. A.A. Baschat, U. Gembruch, The cerebroplacental doppler ratio revisited, UltrasoundObstet. Gynecol. 21 (2003) 124e127
6. P.A. Devine, L.A. Bracero, A. Lysikiemcz, R. Evans, S. Womack, D.W. Byrne,Middle cerebral to umbilical artery doppler ratio in post-date pregnancies,Obstet. Gynecol. 84 (1994) 856e860
7. J. Morales-Rosello, A. Khalil, M. Morlando, A. Bhide, A. Papageorghiou, B. Thilaganathan, Poor neonatal acid-base status in term fetuses with low cerebroplacental ratio, Ultrasound Obstet. Gynecol. 45 (2015) 156e161
8. Singh, Harshika, Manjusha Agrawal, Arvind Bhake, and Nihar Gupta. "COLOUR DOPPLER EVALUATION IN HIGH-RISK PREGNANCY AND PERINATAL OUTCOME." *JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS* 7, no. 43 (October 22, 2018): 4603–8. https://doi.org/10.14260/jemds/2018/1027.
9. Mishra, Kshirod K., Sally John, and Naresh Nebhineni. "Autoimmune Neuropsychiatric Disorders of Childhood." *INDIAN JOURNAL OF PSYCHIATRY* 60, no. 5, 1 (February 2018): 31.
10. Bhriegu, R., M. Agrawal, and C. Hariharan. "Assessment of Maternal and Perinatal Outcome in Postdated Pregnancy." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 1 (2017): 35–40. https://doi.org/10.4103/jdmimsu.jdmimsu_20_17.
11. Gaikwad, K.B., N.G. Joshi, and S.P. Selkar. "Study of Nitrosative Stress in 'Pregnancy Induced Hypertension.'" *Journal of Clinical and Diagnostic Research* 11, no. 3 (2017): BC06–8. https://doi.org/10.7860/JCDR/2017/23960.9396.
12. Roy, M., U.L. Gajbe, B.R. Singh, and P. Thute. "Morphometric Measurement of Fetal Femur Length for the Prediction of Gestational Age in the Ii Nd and Iii Rd Trimester of Pregnancy by Ultrasonography." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 3 (2017): 187–90. https://doi.org/10.4103/jdmimsu.jdmimsu_71_17.
13. Yadav, S., M. Agrawal, C. Hariharan, D. Dewani, K. Vadera, and N. Krishna. "A Comparative Study of Serum Lipid Profile of Women with Preeclampsia and Normotensive Pregnancy." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 2 (2018): 83–86. https://doi.org/10.4103/jdmimsu.jdmimsu_70_17.
14. Phatak, S., D. Shrivastav, G. Marfani, S. Daga, K. Madurwar, and S. Samad. "Transvaginal Sonography and Elastography Evaluation of Ectopic Pregnancy." *Journal of Datta Meghe Institute of Medical Sciences University* 14, no. 2 (2019): 86–89. https://doi.org/10.4103/jdmimsu.jdmimsu_13_19.
15. Wasnik, R.R., and N.R. Akarte. "Evaluation of Serum Zinc and Antioxidant Vitamins in Adolescent Homozygous Sickle Cell Patients in Wardha, District of Central India." *Journal of Clinical and Diagnostic Research* 11, no. 8 (2017): BC01–3. https://doi.org/10.7860/JCDR/2017/30855.10320.
16. Gaikwad, K.B., N.G. Joshi, and S.P. Selkar. "Study of Nitrosative Stress in 'Pregnancy Induced Hypertension.'" *Journal of Clinical and Diagnostic Research* 11, no. 3 (2017): BC06–8. https://doi.org/10.7860/JCDR/2017/23960.9396.
17. Baliga, S., M. Chaudhary, S. Bhat, P. Bhatiya, N. Thosar, and P. Bhansali. "Determination of Toral Antioxidant Capacity of Saliva in Sickle Cell Anemic Patients - A Cross-Sectional Study." *Journal of Indian Society of Pedodontics and Preventive Dentistry* 35, no. 1 (2017): 14–18. https://doi.org/10.4103/0970-4388.199219.

18. Yadav, S., M. Agrawal, C. Hariharan, D. Dewani, K. Vadera, and N. Krishna. "A Comparative Study of Serum Lipid Profile of Women with Preeclampsia and Normotensive Pregnancy." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 2 (2018): 83–86. https://doi.org/10.4103/jdmimsu.jdmimsu_70_17.
19. "Evaluation of Abdominal Malignancies by Minimal Access Surgery: Our Experience in a Rural Setup in Central India." *World Journal of Laparoscopic Surgery* 11, no. 3 (2018): 115–20. https://doi.org/10.5005/jp-journals-10033-1350.
20. Aglawe, P.B., R.K. Jha, V. Mishra, K.M. Sakore, A. Chetan, and D.S. Shrivastava. "Appraisal of Core Therapy, Supportive Therapy, and Alternative Therapy in a Tertiary Care Rural Hospital of Vidarbha Region in Correlation to Plethora of Menopausal Problems." *Journal of Mid-Life Health* 10, no. 1 (2019): 14–21. https://doi.org/10.4103/jmh.JMH-131-18.
21. Gupta, M., S. Samal, D. Shrivastava, N. Bagde, N. Mishra, and S. Gupta. "The Study of Ovulatory Pattern Following Use of Clomiphene Citrate and Anastrozole in Infertile Women with Ovulatory Dysfunction: A Comparative Study." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 1 (2017): 17–20. https://doi.org/10.4103/jdmimsu.jdmimsu_14_17.
22. Gadge, A., N. Acharya, S. Shukla, and S. Phatak. "Comparative Study of Transvaginal Sonography and Hysteroscopy for the Detection of Endometrial Lesions in Women with Abnormal Uterine Bleeding in Perimenopausal Age Group." *Journal of SAFOG* 10, no. 3 (2018): 155–60. https://doi.org/10.5005/jp-journals-10006-1580.
23. Roy, M., U.L. Gajbe, B.R. Singh, and P. Thute. "Morphometric Measurement of Fetal Femur Length for the Prediction of Gestational Age in the Ii Nd and Iii Rd Trimester of Pregnancy by Ultrasonography." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 3 (2017): 187–90. https://doi.org/10.4103/jdmimsu.jdmimsu_71_17
24. Chaudhry P, Jaiswal A. Secondary live abdominal ectopic pregnancy: A case report. World J Laparoscopic Surg 2019;12(2):86-87.
25. Agrawal D, Bhake AS, Rastogi N, Laishram S, Wankhade A, Agarwal A. Role of Bethesda system for reporting thyroid lesion and its correlation with histopathological diagnosis. J Datta Meghe Inst Med Sci Univ 2019;14(2):74-81.
26. Sen B, Chaudhary A, Sen J. Hemodynamic changes with intravenous dexmedetomidine and intravenous esmolol for attenuation of sympathomimetic response to laryngoscopy and tracheal intubation in neurosurgical patients: A comparative study. J Datta Meghe Inst Med Sci Univ 2019;14(2):67-73.
27. Khanam N, Wagh V, Gaidhane AM, Quazi SZ. Knowledge, attitude and practice on uses of plastic products, their disposal and environmental pollution: A study among school-going adolescents. J Datta Meghe Inst Med Sci Univ 2019;14(2):57-60.
28. Chaudhary KS, Phatak SV. Choroidal melanoma in a young patient ultrasonography and magnetic resonance imaging. J Datta Meghe Inst Med Sci Univ 2019;14(2):106-108.
29. Phatak S, Shrivastav D, Marfani G, Daga S, Madurwar K, Samad S. Transvaginal sonography and elastography evaluation of ectopic pregnancy. J Datta Meghe Inst Med Sci Univ 2019;14(2):86-89.
30. Madurwar KA, Phatak SV. Benign fibrous histiocytoma of male breast: Ultrasonography, doppler, and elastography imaging with pathological correlation. J Datta Meghe Inst Med Sci Univ 2019;14(2):103-105.

31. Swarnkar M. Giant calcifying aponeurotic fibroma of web space: case report with review of literature. J Krishna Inst Med Sci Univ 2019;8(2):99-102.
32. Dhatrak AA, Chaudhary K, Singh BR, Gajbe U. Evaluation of intensive pulse polio immunization in Solapur District. J Datta Meghe Inst Med Sci Univ 2019;14(2):82-85.
33. Agrawal M, Acharya N, Joshi K, Shrivastava D. Effectiveness of isosorbide mononitrate in cervical ripening before induction of labor in full-term antenatal patients. J SAFOG 2019;11(2):96-99.
34. Walinjkar RS, Khadse S, Kumar S, Bawankule S, Acharya S. Platelet Indices as a Predictor of Microvascular Complications in Type 2 Diabetes. Indian J Endocrinol Metab 2019;23(2):206-210.
35. Sharma SK, Dheda K. What is new in the WHO consolidated guidelines on drug-resistant tuberculosis treatment? Indian J Med Res 2019;149(3):309-312.
36. Varyani UT, Shah NM, Shah PR, Kute VB, Balwani MR, Trivedi HL. C1q nephropathy in a patient of neurofibromatosis type 1: A rare case report. Indian J Nephrol 2019;29(2):125-127.
37. Dangore Khasbage S, Bhake AS. Cervical lymphadenopathy in a dental patient: An eye opener case report. Spec Care Dent 2019;39(1):59-64.
38. Henry D, Singh A, Madke B, Kedia P. A case of altered clinical picture of extensive tinea corporis (Tinea as a great mimicker). Iran J Dermatol 2019;22(3):107-109.
39. Patond S, Mohite P, Ninave S, Pande V. Knowledge about medicolegal aspect of documentation amongst residents and faculty-a cross-sectional study. J Indian Acad Forensic Med 2019;41(2):117-119.
40. Singh R, Singam A. Comparative evaluation of dexmedetomedine versus clonidine as an adjuvant in supraclavicular brachial plexus block. J Krishna Inst Med Sci Univ 2019;8(3):53-65.
41. Jain S, Deshmukh PT, Lakhotia P, Kalambe S, Chandravanshi D, Khatri M. Anatomical study of the facial recess with implications in round window visibility for cochlear implantation: Personal observations and review of the literature. Int Arch Otorhinolaryngol 2019;23(3):E281-E291.
42. Deshpande SS, Phatak SV. A rare case of bilateral multiple ovarian dermoids with uterine fibroid and ectopic kidney. J Datta Meghe Inst Med Sci Univ 2019;14(1):39-41.
43. Bajaj A, Kumar S, Inamdar AH, Agrawal L. Noninvasive ventilation in acute hypoxic respiratory failure in medical intensive care unit: A study in rural medical college. Intl J Crit Illn Inj Sci 2019;9(1):36-42.
44. Aglawe PB, Jha RK, Mishra V, Sakore KM, Chetan A, Shrivastava DS. Appraisal of core therapy, supportive therapy, and alternative therapy in a tertiary care rural hospital of vidarbha region in correlation to plethora of menopausal problems. J Mid-Life Health 2019;10(1):14-21.
45. Wankhade A, Vagha S, Shukla S, Bhake A, Laishram S, Agrawal D, et al. To correlate histopathological changes and transvaginal sonography findings in the endometrium of patients with abnormal uterine bleeding. J Datta Meghe Inst Med Sci Univ 2019;14(1):11-15.
46. Patond S, Nagrale N, Jain K. Correlation between stature and skull dimensions in the population of central india: A cross sectional study. J Forensic Med Toxicol 2019;36(1):56-58.
47. Nagrale N, Patond S, Jain K. Estimation of cephalic index of chhattisgarhi population: An anthropometric study from central India. J Forensic Med Toxicol 2019;36(1):9-12.
48. Shrivastava D, Master A. Fetal Growth Restriction. J Obstet Gynecol India 2019.
49. Khanam N, Wagh V, Gaidhane AM, Quazi SZ. Assessment of work-related musculoskeletal morbidity, perceived causes and preventive activities practiced to reduce morbidity among brick field workers. Ind J Community Health 2019;31(2):213-219.

50. Swarnkar M, Jindal R. Obstructed obturator hernia: A diagnostic dilemma. J Krishna Inst Med Sci Univ 2019;8(3):115-117.
51. Marfani G, Phatak SV, Madurwar KA, Samad S. Role of sonoelastography in diagnosing endometrial lesions: Our initial experience. J Datta Meghe Inst Med Sci Univ 2019;14(1):31-35.
52. Gulve SS, Phatak SV. Parathyroid adenoma: Ultrasonography, Doppler, and elastography imaging. J Datta Meghe Inst Med Sci Univ 2019;14(1):47-49.
53. Bhayani P, Rawekar R, Bawankule S, Kumar S, Acharya S, Gaidhane A, et al. Profile of urinary tract infection in a rural tertiary care hospital: Two-year cross-sectional study. J Datta Meghe Inst Med Sci Univ 2019;14(1):22-26.
54. Laishram S, Gupta V, Bhake A, Wankhede A, Agrawal D. To assess the utility of proliferative marker Ki-67 in surface epithelial ovarian tumor. J Datta Meghe Inst Med Sci Univ 2019;14(1):6-10.
55. Swarnkar K, Gaikwad S, Uke P, Vagha K, Dalal Y. Apert syndrome presenting with omphalocele. J Krishna Inst Med Sci Univ 2019;8(1):95-99.
56. Balwani MR, Pasari A, Tolani P. Widening spectrum of renal involvement in psoriasis: First reported case of C3 glomerulonephritis in a psoriatic patient. Saudi J Kidney Dis Transpl 2019;30(1):258-260.
57. Balwani MR, Bawankule CP, Pasari A, Tolani P, Vakil S, Yadav R. Minimal change disease and Kimura's disease responding to tacrolimus therapy. Saudi J Kidney Dis Transpl 2019;30(1):254-257.
58. Balwani MR, Bawankule CP, Khetan P, Pasari A. Awareness about kidney and its related function/dysfunction in school going children: A survey from the Central India. Saudi J Kidney Dis Transpl 2019;30(1):202-207.
59. Sharma SK, Mohan A, Singh AD, Mishra H, Jhanjee S, Pandey RM, et al. Impact of nicotine replacement therapy as an adjunct to anti-tuberculosis treatment and behaviour change counselling in newly diagnosed pulmonary tuberculosis patients: An open-label, randomised controlled trial. Sci Rep 2018;8(1).
60. Samad SA, Phatak SV. An unusual case of abdominoscrotal swelling in a young patient-hydrocele en bissac. J Clin Diagn Res 2018;12(11).
61. Widmer M, Piaggio G, Nguyen TMH, Osoti A, Owa OO, Misra S, et al. Heat-Stable Carbetocin Versus Oxytocin to Prevent Hemorrhage after Vaginal Birth. Obstet Gynecol Surv 2018;73(11):613-614.
62. Acharya S, Shukla S. Metabolic healthy obesity-a paradoxical fallacy? J Clin Diagn Res 2018;12(10):OE07-OE10.
63. Samad S, Phatak S. Bilateral axillary accessory breast with ductal ectasia: Ultrasonography and elastographic appearance. J Datta Meghe Inst Med Sci Univ 2018;13(4):206-208.
64. Modi S, Agrawal A, Bhake A, Agrawal V. Role of adenosine deaminase in pleural fluid in tubercular pleural effusion. J Datta Meghe Inst Med Sci Univ 2018;13(4):163-167.
65. Gotarkar S, Ingole A. Knowledge of Anganwadi worker with respect to early childhood development. J Datta Meghe Inst Med Sci Univ 2018;13(4):168-170.
66. Goje K, Phatak S. Testicular torsion causing infarction of testis, ultrasonography and color Doppler imaging. J Datta Meghe Inst Med Sci Univ 2018;13(4):215-216.
67. Sarode RD, Tendolkar VD. Psychological pain as predictor of impulse control among BAMS new entrants: A correlation study. J Datta Meghe Inst Med Sci Univ 2018;13(4):171-174.
68. Mishra KK, Kelkar P, Kumar K. An interesting case of trichotillomania in a pre-school child. J Indian Assoc Child Adolesc Ment Health 2018;14(4):131-135.

69. Sthapak E, Gajbe U, Singh BR. Study of communication between musculocutaneous and median nerves in man. J Anat Soc India 2018;67:S37-S44.
70. Tripathi A, Avasthi A, Grover S, Sharma E, Lakdawala BM, Thirunavukarasu M, et al. Gender differences in obsessive-compulsive disorder: Findings from a multicentric study from northern India. Asian J Psychiatry 2018;37:3-9.
71. Yeola ME, Gode D, Bora AK. Evaluation of abdominal malignancies by minimal access surgery: Our experience in a rural setup in central India. World J Laparoscopic Surg 2018;11(3):115-120.
72. Sharma S, Singh AD, Sharma SK, Tripathi M, Das CJ, Kumar R. Gallium-68 DOTA-NOC PET/CT as an alternate predictor of disease activity in sarcoidosis. Nucl Med Commun 2018;39(8):768-778.
73. Daigavane S, Prasad M. To observe the proportion of amblyopia among children presenting in a rural hospital in Central India. J Datta Meghe Inst Med Sci Univ 2018;13(3):119-121.
74. Gadge A, Acharya N, Shukla S, Phatak S. Comparative study of transvaginal sonography and hysteroscopy for the detection of endometrial lesions in women with abnormal uterine bleeding in perimenopausal age group. J SAFOG 2018;10(3):155-160.

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020