

# Platelet Indices in Coronary artery disease with Pre-diabetes”

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**Abstract:** *One of the most common cause of death world over is Coronary artery disease and it comprises a major public health problem in this decade. Increased platelet agglutination in association with other risk factors increase the probability of development of myocardial ischemia. In diabetic patients, the mean platelet volume is increased when comparison was done with subjects who are normal. However, this relationship between Mean platelet volume and pre-diabetes is not evacuated properly. This will be a cross-sectional study, conducted in the Medicine Department, at AVBRH, a tertiary care teaching hospital situated in the rural area of Wardha District. All patients more than 18 years of age, undergoing angiography in cardiology unit of Medicine Department at AVBRH, Sawangi who have given written consent will be added in the study. We expect to establish a relationship between MPV and Coronary artery disease in our subset of population in India and to correlate it with the severity of CAD on angiography. We would also study the relationship between Mean platelet volume and other risk factors of CAD- especially diabetes and pre-diabetes. Will be drawn on completion of study.*

**Keywords:** *Platelet Volume Indices, Coronary Artery Disease*

## I. Background

One of the most common cause of death world over is Coronary artery disease and it comprises a major public health problem in this decade. Increased platelet agglutination in association with other risk factors increase the probability of development of myocardial ischemia. In diabetic patients, the mean platelet volume is increased when comparison was done with subjects who are normal. However, this relationship between Mean platelet volume and pre-diabetes is not evacuated properly (1-2).

## II. Objectives

1. To study the correlation of PVI values with other risk factors of CAD, including Pre-diabetes, type 2 Diabetes mellitus, hypertension, smoking, family history of CAD and high BMI.
2. To establish a relationship between the severity of CAD on angiography with PVI in patients.

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### III. Methodology

**Setting:** The study will be conducted in the Medicine Department, at AVBRH, a tertiary care teaching hospital situated in the rural area of Wardha District. The study will be undertaken after approval from institute ethical committee (applied for).

**Patients:** We will prospectively enroll all consecutive patients > 18 years of age regardless of gender or ethnicity who undergo Coronary angiogram/angiography at AVBRH, Sawangi.

### IV. This will be a Cross Sectional Study design

**Inclusion criteria:** All patients more than 18 years of age, undergoing angiography in cardiology unit of Medicine Department at AVBRH, Sawangi who have given written consent will be added in the study.

**Exclusion criteria:** Patients < 18 years of age, with thrombocytopenia, with Liver or renal disease, having malignancy, with hereditary disorders of large platelets and on anticoagulants previously will be excluded from the study.

**Methods:** Detailed history and examination of the patients will be undertaken. Family history and previous history of CAD, history of chest pain, H/O smoking and Alcohol intake, medication history will be taken. Assessment of pre-existing comorbidities in patient if any will be enquired by H/O hypertension, Diabetes Mellitus, cancer, chronic kidney disease and chronic liver disease. Physical examination will include- weight, height, BMI- Calculated as weight (kg)/ height (m<sup>2</sup>), Waist circumference and Waist/Hip ratio. <sup>1</sup>As per WHO, measurement of waist circumference should be made at midpoint between margin of last palpable rib and top of iliac crest at minimal respiration in erect position. As per NCEP ATP III normal reference for waist circumference is <90cm in asian men and <80cm in asian women. Hip circumference is to be measured at level of greater trochanters (widest portion of hips). As per WHO, the cut off for Waist hip. Ratio for men and women is >0.90 in men and >0.85 in women.

ECG changes if any will be recorded for all the patients. Blood samples will be collected the day before angiography for blood lipids: high-density and low-density cholesterol, triglycerides, total cholesterol; Complete blood count- platelet count and indices - MPV, PDW & PCT. HbA1c will be done for all the patients. Fasting blood glucose will be recorded for all the patients and patients will be defined into following categories as per WHO criteria for Diabetes 2019: Diabetes if Fasting blood glucose>126mg/dl\* and Pre-diabetes if Fasting blood glucose from 100-125mg/dl\*\*

\*WHO criteria 2019: Diabetes: FBG>126mg per dl, 2hr post glucose>200mg/dl

\*\*WHO criteria 2019: Pre-diabetes: FBG-110-125mg/dl (impaired fasting glucose), 2h post glucose-140-199mg/dl (impaired glucose tolerance).

As all patients will be undergoing coronary angiogram, the indication of CAG will be recorded for everyone and patients will be divided as per angiography findings into: Normal Coronaries (<50% stenosis in coronary arteries) and CAD (>50% stenosis in coronary arteries). Severity of coronary artery disease will be decided as per degree of stenosis (>70% stenosis in atleast one artery) and the amount of vessels involved (Single, Double and triple vessel disease).

<sup>2</sup>MPV is defined the volume of the average circulating platelet and it is measured in femtoliters. The MPV value will vary based on the technique by which the MPV is measured (ie, it is instrument-specific). In addition to that, a patient's true platelet distribution may not fit a log-normal distribution. Hence the manufacturers specify a defined range of MPV within their algorithms. Thus, we must refer to the laboratory's reference for the particular study population.

The normal range for platelet volume has yet to be adequately determined. Studies have shown that the MPV values are different for different races<sup>19</sup>. Studies measuring MPV in sodium citrate in normal subjects. suggest a approximately normal range of 4.5 – 8.5 fl with a mean of 6.5 fl. The day to day variation in MPV is small (CV =2.1%). The range of expected values for MPV in our laboratory is 6-10 fL.

#### ***Sample size and statistical analysis:***

Sample size formula with designed error of margin:

$$n = (Z \alpha/2 \text{ square} \times P (1-P))/d \text{ square}$$

Where, Z alpha/2 is the level of significance at 5% =1.96

P= Prevalence of pre-diabetes=12.8%

So sample size is 172 patients

The data which will be collected will be assessed by IBM, SPSS (IBM Corp., Statistics for Windows, version 23.0.

#### ***Expected Results***

We expect to establish a relationship between MPV and Coronary artery disease in our subset of population in India and to correlate it with the severity of CAD on angiography. We would also study the relationship between Mean platelet volume and other risk factors of CAD- especially diabetes and pre-diabetes.

## **V. Discussion**

Present Study wishes to establish a correlation between platelet volume indices and Pre-diabetes, type 2 Diabetes mellitus, hypertension, smoking, family history of CAD and high BMI. And establish a relationship between the severity of CAD on angiography with PVI in patients.in a recent study, published in the journal of Coronary artery disease, in April 2019, a total of 491 patients who underwent Coronary angiography for chest pain were included. The subjects were divided into subjects who had Coronary artery disease and those who did not have it. Patients with CAD in angiography had higher MPV and MPV was established as an independent risk factor of CAD for patients with angina. This study proposed the use of MPV as a non-invasive marker of CAD on angiography, which may ultimately reduce unnecessary invasive testing. A study by Shimodaira et al,showed that mean platelet volume in patients with prediabetes was more than that in normal subjects, and was positively associated with Fasting plasma glucose levels in prediabetic and normal subjects.In a study done in Haryana by Pujani et al, PVIs were compared among patients with and without type 2 DM. All indices were elevated in patients with HbA1c>7%.

A number of related studies in this region were explored for additional information relevant to geographic context (4-25). Some articles related to other related non-communicable entities(26-44) and sociocultural aspects (45-64) were reviewed.

## VI. REFERENCES

1. Acharya, Sourya, Samarth Shukla, and Anil Wanjari. "Subclinical Risk Markers for Cardiovascular Disease (CVD) in Metabolically Healthy Obese (MHO) Subjects." *JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH* 13, no. 6 (June 2019): OC1–6. <https://doi.org/10.7860/JCDR/2019/41317.12890>.
2. Agrawal, Abhijit, Sunil Kumar, and Jahanvi Bhagwati. "Correlation of Platelet Indices with Clinical Profile in Elderly Patients: A Study in Rural Teaching Hospital." *ANNALS OF MEDICAL AND HEALTH SCIENCES RESEARCH* 8, no. 3 (June 2018): 163–69.
3. Cladius, S., U. Jadhav, B. Ghewade, S. Ali, and T. Dhamgaye. "Study of Diabetes Mellitus in Association with Tuberculosis." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 2 (2017): 143–47. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_62\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_62_17).
4. Bhinder, H.H.P.S., and T.K. Kamble. "The Study of Carotid Intima-Media Thickness in Prediabetes and Its Correlation with Cardiovascular Risk Factors." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 2 (2018): 79–82. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_58\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_58_18).
5. Rathi, N., B. Taksande, and S. Kumar. "Nerve Conduction Studies of Peripheral Motor and Sensory Nerves in the Subjects with Prediabetes." *Journal of Endocrinology and Metabolism* 9, no. 5 (2019): 147–50. <https://doi.org/10.14740/jem602>.
6. Walinjar, R.S., S. Khadse, S. Kumar, S. Bawankule, and S. Acharya. "Platelet Indices as a Predictor of Microvascular Complications in Type 2 Diabetes." *Indian Journal of Endocrinology and Metabolism* 23, no. 2 (2019): 206–10. <https://doi.org/10.4103/ijem.IJEM-13-19>.
7. Phadnis, P., M.A. Kamble, S. Daigavane, P. Tidke, and S. Gautam. "Prevalence and Risk Factors – Hemoglobin A1c, Serum Magnesium, Lipids, and Microalbuminuria for Diabetic Retinopathy: A Rural Hospital-Based Study." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 2 (2017): 121–32. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_59\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_59_17).
8. Dande, R., A.R. Gadbail, S. Sarode, M.P.M. Gadbail, S.M. Gondivkar, M. Gawande, S.C. Sarode, G.S. Sarode, and S. Patil. "Oral Manifestations in Diabetic and Nondiabetic Chronic Renal Failure Patients Receiving Hemodialysis." *Journal of Contemporary Dental Practice* 19, no. 4 (2018): 398–403. <https://doi.org/10.5005/jp-journals-10024-2273>.
9. Phadnis, P., M.A. Kamble, S. Daigavane, P. Tidke, and S. Gautam. "Prevalence and Risk Factors – Hemoglobin A1c, Serum Magnesium, Lipids, and Microalbuminuria for Diabetic Retinopathy: A Rural Hospital-Based Study." *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 2 (2017): 121–32. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_59\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_59_17).
10. Bhayani, P., R. Rawekar, S. Bawankule, S. Kumar, S. Acharya, A. Gaidhane, and M. Khatib. "Profile of Urinary Tract Infection in a Rural Tertiary Care Hospital: Two-Year Cross-Sectional Study." *Journal of*

- Datta Meghe Institute of Medical Sciences University* 14, no. 1 (2019): 22–26. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_87\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_87_18).
11. Cladius, S., U. Jadhav, B. Ghewade, S. Ali, and T. Dhamgaye. “Study of Diabetes Mellitus in Association with Tuberculosis.” *Journal of Datta Meghe Institute of Medical Sciences University* 12, no. 2 (2017): 143–47. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_62\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_62_17).
  12. Bhinder, H.H.P.S., and T.K. Kamble. “The Study of Carotid Intima-Media Thickness in Prediabetes and Its Correlation with Cardiovascular Risk Factors.” *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 2 (2018): 79–82. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_58\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_58_18).
  13. Rathi, N., B. Taksande, and S. Kumar. “Nerve Conduction Studies of Peripheral Motor and Sensory Nerves in the Subjects with Prediabetes.” *Journal of Endocrinology and Metabolism* 9, no. 5 (2019): 147–50. <https://doi.org/10.14740/jem602>.
  14. Walinjkar, R.S., S. Khadse, S. Kumar, S. Bawankule, and S. Acharya. “Platelet Indices as a Predictor of Microvascular Complications in Type 2 Diabetes.” *Indian Journal of Endocrinology and Metabolism* 23, no. 2 (2019): 206–10. <https://doi.org/10.4103/ijem.IJEM-13-19>.
  15. Dande, R., A.R. Gadbail, S. Sarode, M.P.M. Gadbail, S.M. Gondivkar, M. Gawande, S.C. Sarode, G.S. Sarode, and S. Patil. “Oral Manifestations in Diabetic and Nondiabetic Chronic Renal Failure Patients Receiving Hemodialysis.” *Journal of Contemporary Dental Practice* 19, no. 4 (2018): 398–403. <https://doi.org/10.5005/jp-journals-10024-2273>
  16. Varyani, U.T., N.M. Shah, P.R. Shah, V.B. Kute, M.R. Balwani, and H.L. Trivedi. “C1q Nephropathy in a Patient of Neurofibromatosis Type 1: A Rare Case Report.” *Indian Journal of Nephrology* 29, no. 2 (2019): 125–27. [https://doi.org/10.4103/ijn.IJN\\_353\\_17](https://doi.org/10.4103/ijn.IJN_353_17).
  17. Regmi PR, van Teijlingen E, Mahato P, Aryal N, Jadhav N, Simkhada P, et al. The health of nepali migrants in India: A qualitative study of lifestyles and risks. *Int J Environ Res Public Health* 2019;16(19).
  18. Gaidhane A, Sinha A, Khatib M, Simkhada P, Behere P, Saxena D, et al. A systematic review on effect of electronic media on diet, exercise, and sexual activity among adolescents. *Indian J Community Med* 2018;43(5):S56-S65.
  19. Khatib M, Sinha A, Gaidhane A, Simkhada P, Behere P, Saxena D, et al. A systematic review on effect of electronic media among children and adolescents on substance abuse. *Indian J Community Med* 2018;43(5):S66-S72.
  20. Goswami, J., M.R. Balwani, V. Kute, M. Gumber, M. Patel, and U. Godhani. “Scoring Systems and Outcome of Chronic Kidney Disease Patients Admitted in Intensive Care Units.” *Saudi Journal of Kidney Diseases and Transplantation: An Official Publication of the Saudi Center for Organ Transplantation, Saudi Arabia* 29, no. 2 (2018): 310–17. <https://doi.org/10.4103/1319-2442.229268>.
  21. Goyal, R.C., S.G. Choudhari, and S.R. Tankhiwale. “Assessment of Competency Based Medical Internship Training with ‘Cumulative Grade Points Average System’-An Innovative Step towards Meeting ‘Vision 2015’ of Medical Council of India.” *Indian Journal of Public Health Research and Development* 9, no. 8 (2018): 155–62. <https://doi.org/10.5958/0976-5506.2018.00713.1>.

22. Gupta, V., and A. Bhake. "Assessment of Clinically Suspected Tubercular Lymphadenopathy by Real-Time PCR Compared to Non-Molecular Methods on Lymph Node Aspirates." *Acta Cytologica* 62, no. 1 (2018): 4–11. <https://doi.org/10.1159/000480064>.
23. "Reactive Lymphoid Hyperplasia or Tubercular Lymphadenitis: Can Real-Time PCR on Fine-Needle Aspirates Help Physicians in Concluding the Diagnosis?" *Acta Cytologica* 62, no. 3 (2018): 204–8. <https://doi.org/10.1159/000488871>.
24. Hande, A., M. Chaudhary, A. Gadbail, P. Zade, M. Gawande, and S. Patil. "Role of Hypoxia in Malignant Transformation of Oral Submucous Fibrosis." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 38–43. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_40\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_40_18).
25. Hande, A.H., M.S. Chaudhary, A.R. Gadbail, P.R. Zade, M.N. Gawande, and S.K. Patil. "Role of Hypoxia in Malignant Transformation of Oral Submucous Fibrosis." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 38–43. <https://doi.org/10.4103/jdmimsu.jdmimsu>.
26. Jain, J., S. Banait, I. Tiewsoh, and M. Choudhari. "Kikuchi's Disease (Histiocytic Necrotizing Lymphadenitis): A Rare Presentation with Acute Kidney Injury, Peripheral Neuropathy, and Aseptic Meningitis with Cutaneous Involvement." *Indian Journal of Pathology and Microbiology* 61, no. 1 (2018): 113–15. [https://doi.org/10.4103/IJPM.IJPM\\_256\\_17](https://doi.org/10.4103/IJPM.IJPM_256_17).
27. Jain, V., L. Waghmare, T. Shrivastav, and C. Mahakalkar. "SNAPPS Facilitates Clinical Reasoning in Outpatient Settings." *Education for Health: Change in Learning and Practice* 31, no. 1 (2018): 59–60. <https://doi.org/10.4103/1357-6283.239052>.
28. Jaiswal, S., S. Banait, and S. Daigavane. "A Comparative Study on Peripapillary Retinal Nerve Fiber Layer Thickness in Patients with Iron-Deficiency Anemia to Normal Population." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 9–11. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_82\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_82_17).
29. Kasatwar, A., R. Borle, N. Bhola, K. Rajanikanth, G.S.V. Prasad, and A. Jadhav. "Prevalence of Congenital Cardiac Anomalies in Patients with Cleft Lip and Palate – Its Implications in Surgical Management." *Journal of Oral Biology and Craniofacial Research* 8, no. 3 (2018): 241–44. <https://doi.org/10.1016/j.jobcr.2017.09.009>.
30. Khandelwal, V., S. Khandelwal, N. Gupta, U.A. Nayak, N. Kulshreshtha, and S. Baliga. "Knowledge of Hepatitis B Virus Infection and Its Control Practices among Dental Students in an Indian City." *International Journal of Adolescent Medicine and Health* 30, no. 5 (2018). <https://doi.org/10.1515/ijamh-2016-0103>.
31. Khatib, M., A. Sinha, A. Gaidhane, P. Simkhada, P. Behere, D. Saxena, B. Unnikrishnan, A. Khatib, M. Ahmed, and Q.S. Zahiruddin. "A Systematic Review on Effect of Electronic Media among Children and Adolescents on Substance Abuse." *Indian Journal of Community Medicine* 43, no. 5 (2018): S66–72. [https://doi.org/10.4103/ijcm.IJCM\\_116\\_18](https://doi.org/10.4103/ijcm.IJCM_116_18).
32. Khatib, M.N., A. Gaidhane, S. Gaidhane, and Z.S. Quazi. "Ghrelin as a Promising Therapeutic Option for Cancer Cachexia." *Cellular Physiology and Biochemistry* 48, no. 5 (2018): 2172–88. <https://doi.org/10.1159/000492559>.

33. Khatib, M.N., A.H. Shankar, R. Kirubakaran, A. Gaidhane, S. Gaidhane, P. Simkhada, and S.Z. Quazi. "Ghrelin for the Management of Cachexia Associated with Cancer." *Cochrane Database of Systematic Reviews* 2018, no. 2 (2018). <https://doi.org/10.1002/14651858.CD012229.pub2>.
34. Kirnake, V., A. Arora, P. Sharma, M. Goyal, R. Chawlani, J. Toshniwal, and A. Kumar. "Non-Invasive Aspartate Aminotransferase to Platelet Ratio Index Correlates Well with Invasive Hepatic Venous Pressure Gradient in Cirrhosis." *Indian Journal of Gastroenterology* 37, no. 4 (2018): 335–41. <https://doi.org/10.1007/s12664-018-0879-0>.
35. Kumar, S., P. Bhayani, D. Hathi, and J. Bhagwati. "Hyponatremia Initial Presenting Feature of Normal Pressure Hydrocephalus in Elderly Patient: A Rare Case Report." *Journal of Gerontology and Geriatrics* 66, no. 3 (2018): 156–57.
36. Kürhade, G., B.S. Nayak, A. Kurhade, C. Unakal, and K. Kurhade. "Effect of Martial Arts Training on IL-6 and Other Immunological Parameters among Trinidadian Subjects." *Journal of Sports Medicine and Physical Fitness* 58, no. 7–8 (2018): 1110–15. <https://doi.org/10.23736/S0022-4707.17.07666-6>.
37. Madke, B., and J.M. Gardner. "Enhanced Worldwide Dermatology-Pathology Interaction via Facebook, Twitter, and Other Social Media Platforms." *American Journal of Dermatopathology* 40, no. 3 (2018): 168–72. <https://doi.org/10.1097/DAD.0000000000000963>.
38. Marfani, G.M., S.V. Kashikar, and S. Singhania. "Double Barrel Oesophagus-A Case Report." *Journal of Clinical and Diagnostic Research* 12, no. 8 (2018): TD01–2. <https://doi.org/10.7860/JCDR/2018/36419.11912>.
39. Mathur, K., S. Ninave, S. Patond, S. Ninave, and P. Wankhade. "A Comparative Study of Estimation of Stature by Bertillon's System among Individuals of Different Regions of India." *Journal of Indian Academy of Forensic Medicine* 40, no. 3 (2018): 301–6. <https://doi.org/10.5958/0974-0848.2018.00054.4>.
40. Mishra, K.K., P. Kelkar, and K. Kumar. "An Interesting Case of Trichotillomania in a Pre-School Child." *Journal of Indian Association for Child and Adolescent Mental Health* 14, no. 4 (2018): 131–35.
41. Mittal, V., T. Jagzape, and P. Sachdeva. "Care Seeking Behaviour of Families for Their Sick Infants and Factors Impeding to Their Early Care Seeking in Rural Part of Central India." *Journal of Clinical and Diagnostic Research* 12, no. 4 (2018): SC08-SC12. <https://doi.org/10.7860/JCDR/2018/28130.11401>.
42. Modi, L., S.R. Gedam, I.A. Shivji, V. Babar, and P.S. Patil. "Comparison of Total Self-Stigma between Schizophrenia and Alcohol Dependence Patients." *International Journal of High Risk Behaviors and Addiction* 7, no. 3 (2018). <https://doi.org/10.5812/ijhrba.61043>.
43. Modi, S., A. Agrawal, A. Bhake, and V. Agrawal. "Role of Adenosine Deaminase in Pleural Fluid in Tubercular Pleural Effusion." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 4 (2018): 163–67. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_77\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_77_17).
44. Mohite, D., A. Hande, R. Gupta, M. Chaudhary, P. Mohite, S. Patil, and M. Gawande. "Immunohistochemical Evaluation of Expression Pattern of P53, P63, and P73 in Epithelial Dysplasia." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 3 (2018): 122–29. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_64\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_64_18).

45. Mohite, P.M., A.J. Anjankar, and S. Patnod. "Organo PHOSPHORUS POISONING: Prognostic Value of GCS Score and Other Clinical Indicators in Assessing the Final Outcome." *Journal of Indian Academy of Forensic Medicine* 40, no. 2 (2018): 197–205. <https://doi.org/10.5958/0974-0848.2018.00035.0>.
46. Mundada, B.P., S. Surana, N. Bhola, S. Oswal, and P. Dakshinkar. "Multiple Recurrent Simultaneous Salivary Calculi." *Journal of Clinical and Diagnostic Research* 12, no. 5 (2018): ZJ01–2. <https://doi.org/10.7860/JCDR/2018/34546.1146>.
47. Munjal, R., and G. Mudey. "Nasal Carriage of Staphylococcus Aureus among Undergraduate Medical Students: Prevalence and Antibioqram Including Methicillin Resistance, Inducible Clindamycin Resistance, and High-Level Mupirocin Resistance." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 2 (2018): 91–94. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_10\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_10_18).
48. Nandanwar, J., M. Bhongade, S. Puri, P. Dhadse, M. Datir, and A. Kasatwar. "Comparison of Effectiveness of Hyaluronic Acid in Combination with Polylactic Acid/Polyglycolic Acid Membrane and Subepithelial Connective Tissue Graft for the Treatment of Multiple Gingival Recession Defects in Human: A Clinical Study." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 48–53. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_39\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_39_18).
49. Oswal, N., M. Chandak, R. Oswal, and M. Saoji. "Management of Endodontically Treated Teeth with Endocrown." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 60–62. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_38\\_17](https://doi.org/10.4103/jdmimsu.jdmimsu_38_17).
50. Pal, S., R.M. Oswal, and G.K. Vankar. "Recognition of Major Depressive Disorder and Its Correlates among Adult Male Patients in Primary Care." *Archives of Psychiatry and Psychotherapy* 20, no. 3 (2018): 55–62. <https://doi.org/10.12740/APP/89963>.
51. Papalkar, P., S. Kumar, S. Agrawal, N. Raisinghani, G. Marfani, and A. Mishra. "Heterotaxy Syndrome Presenting as Severe Pulmonary Artery Hypertension in a Young Old Female: Case Report." *Journal of Gerontology and Geriatrics* 66, no. 2 (2018): 59–61.
52. Parlani, S., S. Tripathi, and A. Bhojar. "A Cross-Sectional Study to Explore the Reasons to Visit a Quack for Prosthodontic Solutions." *Journal of Indian Prosthodontist Society* 18, no. 3 (2018): 231–38. <https://doi.org/10.4103/jips.jips-24-18>
53. Patel, T.V., M.J. Brahmhatt, and G.K. Vankar. "Prevalence of Alcohol Use Disorders in Hospitalised Male Patients." *Archives of Psychiatry and Psychotherapy* 20, no. 4 (2018): 47–55. <https://doi.org/10.12740/APP/99147>.
54. Patil, S., R. Ranka, M. Chaudhary, A. Hande, and P. Sharma. "Prevalence of Dental Caries and Gingivitis among Pregnant and Nonpregnant Women." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 44–47. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_5\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_5_18).
55. Phatak, S., and G. Marfani. "Galactocele Ultrasonography and Elastography Imaging with Pathological Correlation." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 1–3. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_51\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_51_18).

56. Rajan, R., S. Gosavi, V. Dhakate, and S. Ninave. "A Comparative Study of Equipotent Doses of Intrathecal Clonidine and Dexmedetomidine on Characteristics of Bupivacaine Spinal Anesthesia." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 4–8. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_59\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_59_18).
57. Rajan, R., S.N. Gosavi, V. Dhakate, and S. Ninave. "A Comparative Study of Equipotent Doses of Intrathecal Clonidine and Dexmedetomidine on Characteristics of Bupivacaine Spinal Anesthesia." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 4–8. <https://doi.org/10.4103/jdmimsu.jdmimsu>.
58. Ransing, R., S. Patil, K. Pevekar, K. Mishra, and B. Patil. "Unrecognized Prevalence of Macrocytosis among the Patients with First Episode of Psychosis and Depression." *Indian Journal of Psychological Medicine* 40, no. 1 (2018): 68–73. [https://doi.org/10.4103/IJPSYM.IJPSYM\\_139\\_17](https://doi.org/10.4103/IJPSYM.IJPSYM_139_17).
59. Rathi, A., R.S. Ransing, K.K. Mishra, and N. Narula. "Quality of Sleep among Medical Students: Relationship with Personality Traits." *Journal of Clinical and Diagnostic Research* 12, no. 9 (2018): VC01–4. <https://doi.org/10.7860/JCDR/2018/24685.12025>.
60. Samad, S., and S. Phatak. "Bilateral Axillary Accessory Breast with Ductal Ectasia: Ultrasonography and Elastographic Appearance." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 4 (2018): 206–8. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_54\\_18](https://doi.org/10.4103/jdmimsu.jdmimsu_54_18).
61. Samad, S.A., and S.V. Phatak. "An Unusual Case of Abdominoscrotal Swelling in a Young Patient-Hydrocele En Bissac." *Journal of Clinical and Diagnostic Research* 12, no. 11 (2018). <https://doi.org/10.7860/JCDR/2018/37640.12278>.
62. Sarode, R.D., and V.D. Tendolkar. "Psychological Pain as Predictor of Impulse Control among BAMS New Entrants: A Correlation Study." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 4 (2018): 171–74. [https://doi.org/10.4103/jdmimsu.jdmimsu\\_26\\_19](https://doi.org/10.4103/jdmimsu.jdmimsu_26_19).
63. Sharma, P., M. Gawande, M. Chaudhary, and R. Ranka. "T-Cell Lymphoma of Oral Cavity: A Rare Entity." *Journal of Oral and Maxillofacial Pathology* 22, no. 1 (2018): 104–7. [https://doi.org/10.4103/jomfp.JOMFP\\_153\\_16](https://doi.org/10.4103/jomfp.JOMFP_153_16).
64. Sharma, S.K., A. Mohan, A.D. Singh, H. Mishra, S. Jhanjee, R.M. Pandey, B.K. Singh, 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." *Scientific Reports* 8, no. 1 (2018). <https://doi.org/10.1038/s41598-018-26990-5>.