



Peri Operative Hypertension- A Review

Author

Dr Nataraj .G

Dept of General Medicine, Shridevi Institute of Medical Sciences and Research

Sira Road, NH-4, Tumakuru.572105, Karnataka, India

Email: nata_g@rediffmail.com

Abstract

Peri operative blood pressure variation are common phenomenon during elective and emergency surgical interventions. Hypertension may be diagnosed, for the first time, during peri operative period. Risk factors like anxiety, stress, medications, smoking and alcohol can produce fluctuations in BP readings. During, Peri operative period, BP reading can reach, alarmingly high, causing acute target organ dysfunction and complications. A thorough assessment and timely medications can influence good prognostic outcome in this group. Also this group, require periodic follow up for possible, transformation to Essential hypertension.

Introduction

Blood pressure variability is a common phenomenon during peri operative period, especially pre operative period. Often the physicians are sought for management of high blood pressure in these groups. The blood pressure variability can reach up to Systolic BP of ≥ 200 mm of Hg and diastolic BP of above 100mm of Hg. So these patients are under risk for the acute target organ dysfunction which can involve heart, kidney, CNS and retina. These patients need thorough assessment and timely medication to prevent complications.

Incidence

25% of patients undergoing noncardiac surgery may be under risk for peri operative hypertension². High blood pressure may be noticed or diagnosed for first time in some these individuals

Risk Factors

Primary HT

Anxiety, depression

Smoking, Alcohol

Sleep disturbances

Drugs-- Sympatho mimetics like pseudo ephedrine, Xylo metazoline

Clonidine withdrawal, Erythropoietin

NSAIDS. Steroids

Drugs abuse—Cocaine, Amphetamine

Pathogenesis

Increased Systemic vascular resistance plays important role in peri operative HT³. Catecholamine surge, vasomotor reactivity during peri operative period may be responsible for blood pressure variability^{1,3}. Rebound hypertension may be important factor in certain cases of post operative patients². Certain surgeries are likely to encounter acute hypertension. These include²,

cardiac surgery, major vascular surgery (eg, carotid endarterectomy, aortic surgery), neurosurgery, head and neck surgery, renal transplantation, and major trauma (i e, burns or head injury).

Renin angiotensin aldosterone system (RAAS) has considerable influence on BP Changes during peri operative period⁸

Environmental influences like, physical inactivity, low potassium and calcium intake can contribute for development of Hypertension¹⁰.

Assessment

These patients require thorough clinical history and examination. Target historical issues for above potential risk factors. Essential hypertension may be identifiable for the first time during admission for surgical procedures. Also to look for pre existing hypertension related target organ effects like left ventricular hypertrophy, retinopathy and renal dysfunctions. Also It is advisable to look for prior patient medical records for BP variations, recordings¹⁰ and medications.

The concept of White coat hypertension¹¹ is unclear⁴. It can influence us for possibility of initiation of treatment with antihypertensive medications. Whether white coat hypertension, progresses to develop true Essential HT or not, is unclear. It needs larger study to conclude on this issue. Ambulatory blood pressure monitoring may be useful in this group of patients regarding presence of persistence of high Blood pressure¹². Also, It's unclear regarding the duration of therapy for this category of HT.

Reassess and re record the Blood pressure readings with proper sized cuff and comfortable position. Periodic BP monitoring at regular interval of 2-4 hourly is useful.

ECG AND 2 D ECHO are helpful for defining presence of LVH and Ventricular function assessment. Renal function test s are helpful for assessing for possible renal impairment.

Complications

The BP variability can produce hemodynamic changes in peri operative patients. Some of the complications include

Cardiac⁴

Acute coronary syndrome (ACS)

Arrhythmias

Acute Left ventricular failure

Hypertensive crisis

Blood pressure variability can go upto the ranges of 200 systolic and above and diastolic pressure of 120 and more. Hence persons can be exposed to risks of target organ dysfunction like ACS, Cerebro vascular accidents (CVA), Acute kidney injury, and arrhythmias.

Non cardiac

Bleeding from operative sites

Renal impairment

Anxiety and sleepless can be issues in certain patients.

Management

It is necessary to look for reversible factors and correct these issues before surgery. With hold or delay the initiation of antihypertensive drugs, unless person is in hypertensive crisis and persistent high Blood pressure. Its essential to inform the patients to abstain from smoking, Alcoholism and inadvertent intake NSAIDS during preoperative period.

Non pharmacological therapy

Exercise^{6,7}, Relaxation, counselling⁹ and meditation⁶ have some influence of normalizing BP and its variations.

Pharmaco therapy

Beta blockers- beta blockers are sympatholytic drugs and hence reduce heart rate, anxiety, sudden death and overall mortality⁵. Short acting Beta blockers like Propranolol (40-160mgs), Metoprolol (12.5 -25 mgs) in divided dosage are useful for good control of BP. These drugs are required to be continued for short time 2-4 weeks and reassess for BP status and drug requirement

Labetalol can be option in patients showing markedly elevated BP (>180/110mm of Hg) readings².

Centrally acting Adrenergic agonist –Clonidine (0.1 mgs, in divided dosage) is of considerable benefit in many of resistant cases of uncontrolled blood pressure patients. Many patients tolerate the procedure well, without any complication during peri operative period. side effects⁵ of these

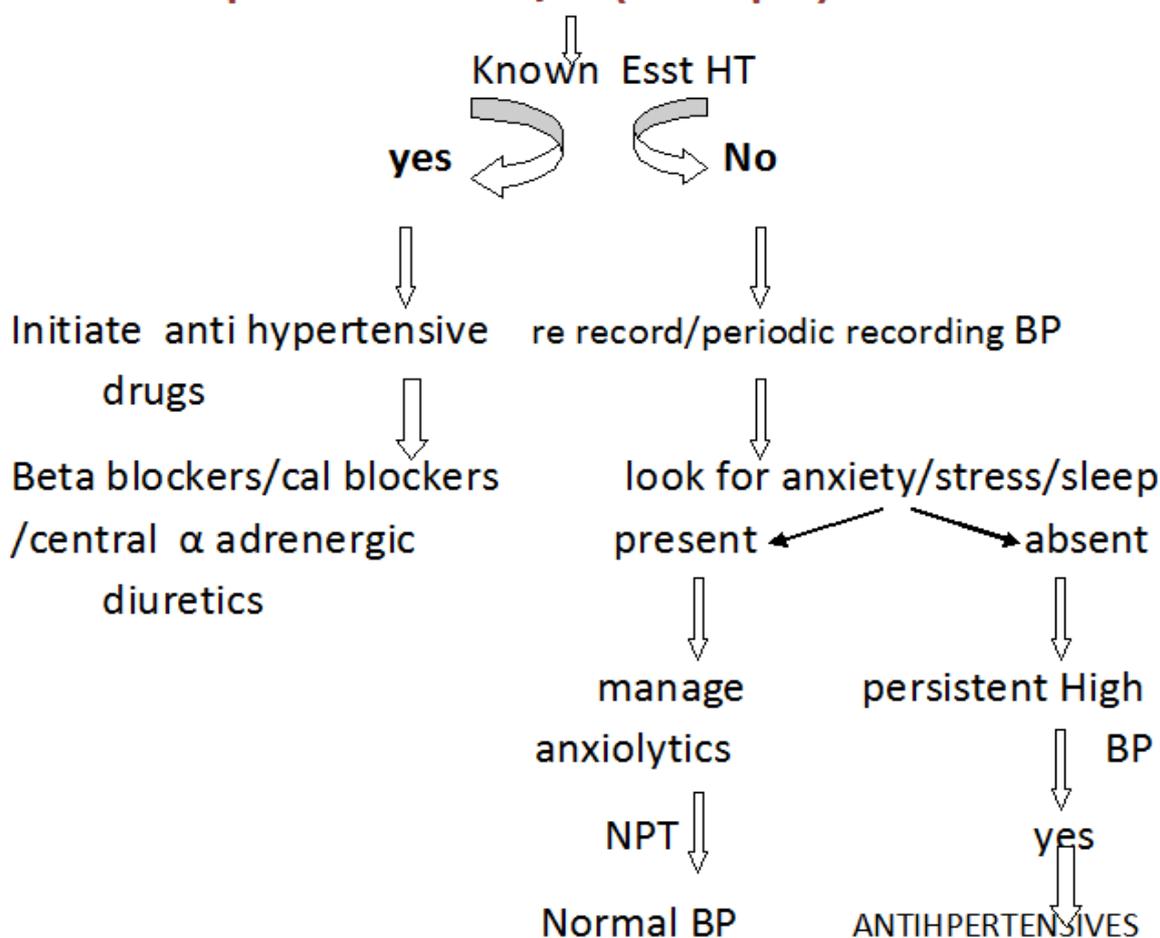
include somnolence, dry mouth, and rebound hypertension on withdrawal.

Benzodiazepines

Alprazolam (0.25 -1 mgs), Clonazepam (0.5 – 2 mgs) are helpful for relieving anxiety and stress. These drugs need to be continued for short period (1-2 weeks) during, peri operative period.

An approach to high blood pressure status during peri operative period

Blood pressure > 140/90(multiple)



Conclusion

Peri operative blood pressure variations are notable events both in normotensive and hypertensive groups. So optimum control of blood pressure and risk factors can influence the better prognostic outcome in this group.

References

1. Vineet Chopra, MD; Scott A. Flanders, MD; James B. Froehlich, MD, MPH; et al. 'Perioperative Practice: Time to Throttle Back'. Annals of Internal medicine. February 2, 2010, 152 (3)
2. Joseph Varon1 and Paul E Marik. Perioperative hypertension management.

- Vasc Health Risk Manag. 2008 Jun; 4(3): 615–627. Published online 2008 Jun.
3. Levy JH . The ideal agent for perioperative hypertension and potential cytoprotective effects. Acta Anaesthesiol Scand Suppl. 1993;99:20-5
 4. P Foëx, JW Sear. The surgical hypertensive patient. Oxford Journals Medicine & Health .BJA: CEACCP, Volume 4, Issue 5.Pp. 139-143.
 5. Harrison's principles of medicine.19 edit . chapter on Hypertensive Vascular Disease. Theodore A. Kotchen.pgs 1611-1627
 6. RANDY WEXLER, M.D., M.P.H., and GLEN AUKERMAN, M.D., Ohio State University College of Medicine, Columbus, Ohio. 'Nonpharmacologic Strategies for Managing Hypertension'. Am Fam Physician. 2006 Jun 1;73(11):1953-1956.
 7. LAWRENCE J. APPEL, M.D., Nonpharmacologic Therapies that Reduce Blood Pressure: A Fresh Perspective .Clin. Cardiol. 22, (Suppl. III), 111-1-111-5 (1999)
 8. Simon James Howell. Preoperative Hypertension: Current Anesthesiology Reports. March 2018, Volume 8, Issue 1, pp 25–31
 9. Renu Bala, Naveen Malhotra, Divyansh Singh, Kulsaurabh Kaushik: Perioperative concerns in patients with 'white coat hypertension'. Anaesthesia, Pain & Intensive Care ISSN 1607-8322, ISSN (Online) 2220-5799.
 10. V Nadella, MBBS DA FCAI SJ Howell, MA(Cantab) MRCP FRCA MSc MD. 'Hypertension: pathophysiology and perioperative implications' Continuing Education in Anaesthesia Critical Care & Pain, Volume 15, Issue 6, 1 December 2015, Pages 275–279
 11. Silva RP, Sousa NRP, Costa PSC, Rocha MG (2016) Who is the Patient with Suspected White Coat Hypertension? . J Clin Exp Cardiol 7:428. doi:10.4172/2155-9880.1000428
 12. Whelton PK, et al. 2017. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults . High Blood Pressure Clinical Practice Guidelines (Hypertension. 2017;00:e000-e000.) © 2017 by the American College of Cardiology Foundation and the American Heart Association, Inc. Hypertension is available at <http://hyper.ahajournals.org>.Pgs 35-36.

Abbreviations

- BP- Blood Pressure
 LVH - left ventricular hypertrophy
 CVA - Cerebro vascular accident
 ACS- Acute coronary syndrome
 NPT- Non pharmacological Therapy
 ABPM- Ambulatory blood pressure monitoring
 CNS- Central nervous system
 Esst HT- Essential Hypertension