

Critical care .

Hemodynamic Pressures

Homework 1

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**NURS3250, CRITICAL CARE NURSING 1**

**Male patient 60 years old admitted to CCU post CABG, Pt has A.L, CVP line, Swan Ganz Catheter, Hemodynamic monitoring are B.P 80/60 mm/Hg ,pulse 130 b/m ,CVP 1 mm/Hg,PAWP 4mm/Hg ,MPAP 7 mm/Hg ,CO 3L / m , BSA 2 / M 2 ,weight 70 kgm ,urine out put 20 cc/hr .**

**According to heamodynamic data answer these questions**

**1- Calculate the MAP? Interpretation?**

**MAP = S+2D/3 = 80+2\*60 / 3= 66,7 hypotension**

**2- Pulse pressure? Interpretation?**

**= S-D = 80-60 =20 , narrow pulse pressure**

**3-CI ? SV ? Interpretation ?**

**CI =CO/BSA =3/2=1.5**

**SV = CO/HR = 3000/130=23 , r/t hypovolemia**

**4-SVR ? Interpretation ?**

**SVR=MAP-CVP/CO \*80**

**=66,7-1/3000\*80=1752 , hypovolemia**

**5-PVR ?interpretation ?**

**PVR = (MPAP– PAWP \CO) \* 80**

**=(7-4/3)\*80 = 80 , low r/t wedge pressure**

**6-EF if EDV is 40 CC ?**

**EF = SV/EDV = 23/40 = 0,575 \*100 % = 57,5 .**

**7-What is the possible causes of abnormal heamodynamic readings?\_**

 **hypovolemia or bleeding**

**8- Management in this case is ?**

**Fluid replacement**

**9-What is the reading of CVP IN ( cm water ) ?**

**1\*1.36 mm/Hg**

**10- What the effects of hypovolemia on pre load and after load? and what the effects on heart?**

 **Preload low , afterload high , HR high**

**11-Whats are the effects of the following management on the heart?**

**Inotropic drugs CO high**

**Vasodilator drugs AFTERLOAD\_low**

**Diuretics PRELOAD low**

**IABP \_\_AFTERLOAD\_low**

**Vasodilator drugs on SVR SVR low**

**Male patient 55 yrs. old. 70 kg admitted to CCU diagnosed of Myocardial Infarction. Hemodynamic data: BP 100/40, Pulse 125 b/m, CVP 12 mmHg, Respiration 18/m, Temp. 36.5 C, CO 2/L, O2 SAT 88%, Cardiac Enzymes elevated, ECG shows ST elevation in lead 2, lead 3 and AVF, Dr requested to start streptokinase 1.5 million I.U over 1 hr., start Nitroglycerin infusion 50 mcg/min ,using a Nitroglycerin Admixture of 50 mg in D5W 250 ml, Heparin infusion and give Aspirin 300 mg P.O, Lasix 40 mg I.V STAT and applied nasal cannula 2/L, Chest x-ray shows LV congestion.**

**1-Calculate the MAP? Interpretation?**

**MAP = 2D+S \ 3 = (2\*40) +100\3 = 60 , hypotension**

**2- Pulse Pressure? Interpretation?**

 **= S – D = 100 – 40 = 60 , wide pulse pressure .**

 **3- SVR? Interpretation ?**

**(MAP – CVP \ CO ) \*80 = (60 – 12 \ 2) \* 80 = 1920 , low CO , hypovolemia**

**4- What you expect the reading for PAP and PAWP and why ?**

**5-What is your interpretation of high reading CVP?**

**Rt sided heart failure , Volume overload**

**6-What type of shock you suspect the patient may have follow MI?**

**Cardiogenic shock .**

**7-What is the classification and action of streptokinase, Aspirin, Heparin and Nitroglycerin drugs?**

**Streptokinase (SK) is a thrombolytic medication and enzyme. As a medication it is used to break down clots**

**Aspirin is known as a salicylate and a nonsteroidal anti-inflammatory drug (NSAID) used to reduce fever and relieve mild to moderate pain, and swelling in conditions such as arthritis**

**as antiplatelet is lower the risk of forming a blood clot in the arteries of the heart (coronary arteries) or brain , Antiplatelets interfere with the binding of platelets, or the process that actually starts the formation of blood clots**

**heparin as anticoagulant, Anticoagulants interfere with the proteins in your blood that are involved with the coagulation process These proteins are called factors. Different anticoagulants interfere with different factors to prevent clotting**

**Nitroglycerin causes the relaxation of vascular smooth muscles, causing arteriolar and venous dilatation. It reduces cardiac preload and afterload and reduces coronary artery spasm, decreasing systemic vascular resistance as well as systolic and diastolic blood pressure**

**8-Calculate the IV infusion rate in millimeters per hour for nitroglycerin?**

**Rate = (50 \* 60 \*250) \(50\*1000) = 150 / 10 = 15 ml / hr.**

**9-Echo cardiograph done for patient and show 35 % Ejection fraction, what is E.F mean and what is its normal range?**

**Ejection fraction (EF) : how much blood the left ventricle pumps out with each contraction .**

**This indication of how well your heart is pumping out blood can help to diagnose and track heart failure.**

**A normal ejection fraction is about 50% to 75%**

**10-Patient next day start Dopamine infusion, 5 mic / kg / m, classification, for dopamine infusion and the effect of dopamine ?**

**Dopamine is indicated for the correction of hemodynamic imbalances present in the shock syndrome due to myocardial infarction, trauma, endotoxic septicemia, open-heart surgery, renal failure, and chronic cardiac decompensation as in congestive failure .**

**Classification : Inotropic Agents**

**Effect: Fast heart rate, Chest pain ,Hypotension ,hypertension ,Vasoconstriction ,Shortness of breath, Nausea, Vomiting, Azotemia ,Headache , Anxiety ,Dilated pupils**

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