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TREATMENT AND RECOMMENDATIONS FOR HOMELESS PATIENTS WITH HYPERTENSION, HYPERLIPIDEMIA & HEART FAILURE-A REVIEW

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ABSTRACT

Cardiovascular disease comprises coronary artery diseases such as angina and myocardial infarction (also known as a heart attack). Other cardiovascular disease consists of stroke, heart failure, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmia, congenital heart disease, thromboembolic disease, and venous thrombosis. . It can also know their treatment and many of the cardiovascular disease risk factors like what they are and how they can be influenced positively to minimize cardiovascular diseases. The primary mechanisms vary depending on the disease. Actual goal of this review article is to survey the various methods to treat and recommends for homeless patients with hypertension, hyperlipidemia & heart failure. This article also explains the negative effect of behaviors such as smoking and drinking too much alcohol on cardiac and vascular health. This should have an appreciation of the 'bigger picture' and see how all these factors combine to influence our cardiovascular health that in itself will affect our relationships and our daily lives, at home and at work.

Keywords: Survey, case studies, cardiovascular disease, hypertension, homeless adult with hyperlipidemia.

INTRODUCTION

Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels [1]. Coronary artery disease, stroke, and peripheral artery disease involve atherosclerosis. This may be caused by high blood pressure, smoking, diabetes mellitus, lack of exercise, obesity, high blood cholesterol, poor diet, and excessive alcohol consumption, among others. High blood pressure is estimated to account for approximately 13% of CVD deaths, while tobacco accounts for 9%, diabetes 6%, lack of exercise 6% and obesity 5%. Rheumatic heart disease may follow untreated strep throat [2-4].

It is estimated that up to 90% of CVD may be preventable. Prevention of CVD involves improving risk factors through: healthy eating, exercise, avoidance of tobacco smoke and limiting alcohol intake. Treating risk factors, such as high blood pressure, blood lipids and diabetes is also beneficial. Treating people who have strep throat with antibiotics can decrease the risk of rheumatic heart disease. The use of aspirin in people, who are otherwise healthy, is of unclear benefit.

Cardiovascular diseases are the leading cause of death globally. This is true in all areas of the world except Africa. Together CVD resulted in 17.9 million deaths (32.1%) in 2015, up from 12.3 million (25.8%) in 1990. Deaths, at a given age, from CVD are more common and have been increasing in much of the developing world, while rates have declined in most of the developed world since the 1970s. Coronary artery disease and stroke account for 80% of CVD deaths in males and 75% of CVD deaths in females. Most cardiovascular disease affects older adults. In the United States 11% of people between 20 and 40 have CVD, while 37% between 40 and 60, 71% of people between 60 and 80, and 85% of people over 80 have CVD.[1] The average age of death from coronary artery disease in the developed world is around 80 while it is around 68 in the developing world. Diagnosis of disease typically occurs seven to ten years earlier in men as compared to women [5-6].

➢ CASE STUDY: HOMELESS ADULT WITH HYPERTENSION:

1. Presentation: H.T. is a 45–year-old Caucasian male who came to the homeless clinic for refill of an antihypertensive medication (clonidine). Transient and without a regular source of care, he says that he has been

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out of his medication for 3 days. ("I feel bad and really need my blood pressure medicine.")

2. Medical history: The patient has no known drug allergies. The patient limps, with some pain and unsteadiness, status post reconstruction of his left leg following a motor vehicle accident years ago.

3. Family History: He says there is a history of hypertension and substance abuse in his family.

4. Social history: H.T. smokes 1-2 packs of cigarettes per day and denies alcohol use or abuse.

5. Review of Systems: denies chest pain; no shortness of breath or dyspnoea on exertion; denies headache or visual problems.

6. Labs in clinic: Urinalysis negative for protein or hematuria.

7. Assessment: hypertensive urgency; suspected misuse of clonidine.

8. Plan of care: recommended immediate referral to emergency room of local hospital for urgent antihypertensive therapy.

9. Outcome: After repeated but unsuccessful attempts to persuade the patient to go to the ER, he was treated in the clinic. It took several hours to bring his blood pressure below a dangerous level using the available medication, clonidine. On subsequent visits he had persistent labile hypertension and resisted any attempts to try other medications.

10. Abby Hale, PA-C, Community Health Centre of Burlington, Vermont, 2003

HYPERTENSION IN HOMELESS ADULTS:

DIAGNOSIS AND EVALUATION

HISTORY

1. Chief Complaint & History of Present Illness: At the beginning of every visit, ask how the patient has been feeling and how s/he feels right now.

2. Living Conditions: At every visit, ask where the patient is staying ("describe the place where you sleep"), where s/he spends time during the day, and how s/he can be contacted. Ask explicitly about access to basic needs (food, shelter, restrooms, and a place to store medications). Lack of stable housing complicates health care and adherence to treatment. Try to ascertain if the patient lives alone or if s/he lives with friends or family.

3. Medical history: Ask whether the patient has ever had high blood pressure, a heart attack, or stroke. Ask about other cardiac risk factors, including diabetes, high cholesterol, and chest pain. Acuity and multiplicity of health problems often seen in homeless patients and sporadic follow-up make good history taking and prioritization of treatment goals especially difficult.

4. Family history: Ask if anyone in the patient's family has had hypertension, a heart attack, or stroke.

5. Dietary history: Explore the patient's diet. Ask where meals are obtained (e.g., soup kitchens, shelters, missions) and what the patient eats. Ask specifically about foods high in sodium, cholesterol or saturated fats. Ask about dietary choice, control over food preparation, and use of added salt. Ask about cultural/ethnic heritage. Food preferences of particular groups, including Hispanics and African Americans, can be high in saturated fat and sodium.

6. Alcohol/Drug use: Ask about use of substances that can cause or exacerbate high blood pressure. Ask about alcohol use and when the patient's last drink was (high blood pressure is often seen during periods of withdrawal from alcohol use). Ask about other drug use—especially stimulants such as cocaine, ephedra, caffeine (including energy drinks that contain caffeine), and amphetamines. Look for anything that may complicate treatment adherence (e.g., smoking, obesity, alcohol, other addictive or sedative substances). Assessment of substance use can be conducted through patient written self-report, nursing triage, or social service screening. If possible, seek assistance from a drug and alcohol or social worker to complete a comprehensive assessment [7-10].

PHYSICAL EXAMINATION

1. Standard exam: Vital signs including properly measured blood pressure and heart rate, peripheral pulses, lungs, abdomen; limited fundoscopic exam for papiledema or nicking; arms and legs for swelling; skin for cholesterol deposits (xanthomas), acanthosis nigricans and skin tags (indicative of metabolic syndrome). Check blood pressure with the patient's feet flat on the floor, at least one-half hour after smoking or drinking caffeine.

2. Lower extremities: Examine with shoes removed. Differentiate swelling due to heart failure from dependent edema secondary to sleeping upright on park benches, sitting in chairs, excessive walking. Pitting vs. non-pitting edema.

DIAGNOSTIC TESTS:

1. General laboratory panels: Obtain fasting lipid profile, fasting blood glucose, complete blood count, urinalysis, urine microalbumin: creatinine ratio annually, and electrocardiogram. Measure serum creatinine, sodium, calcium, and potassium levels according to standard clinical guidelines (a chemistry panel may be less expensive). No homeless-specific adaptations recommended. Screen for diabetes according to standard American Diabetes Association clinical guidelines. If fasting is problematic, consider non-fasting glucose (100–125 for impaired fasting glucose, > 200 x 2, diagnostic for Type 2 diabetes), non-fasting total cholesterol and HDL, and direct measurement of LDL (if available, affordable).

2. Depression screening: The Health Disparities Collaboratives recommend that depression screening be integrated into all chronic care. Many popular and well-validated screening tools are available for use in any primary care population. National measures recommended by the Health Disparities Collaborative on Depression are based on the 9-item Patient Health.

3. Cognitive assessment: Regularly assess for cognitive impairment related to long-term alcohol/drug use or

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normal aging, which may affect adherence to treatment regimens.

4. Test results: Make it easy for patients to get laboratory test results; use case managers to bring the patient back to clinic for test results and further treatment. Provide the patient with a copy of test results on a wallet-sized card, including latest blood pressure measurement, creatinine and potassium levels, high/low density lipoproteins (HDL/ LDL).

PLAN AND MANAGEMENT:

PLAN OF CARE:

1. Nutrition referral: Refer the patient to a nutritionist, preferably a member of the clinical team, who is knowledgeable about the limited food choices that homeless people typically have.

2. Adherence: At the end of every visit, discuss the plan of care with the patient; ask if anything about it is unclear or difficult, and work with him/her to address obstacles to adherence. Recognize that lifestyle changes (reduced fat intake, weight control, increased exercise) are especially difficult for homeless individuals, and that food provided by shelters and soup kitchens is not always conducive to cardiovascular health.

3. **Benefits assistance:** Assess the patient's likelihood of qualifying for Food Stamps and other benefits (SSI/SSDI, Medicaid/Medicare, subsidized housing) and help him or her complete necessary paperwork.

EDUCATION, SELF-MANAGEMENT:

1. Self-management goals: Encourage the patient to select his/her own goals, even if they differ from the providers' goals or are prioritized differently. Ask what s/he would like to work on (e.g., lose 5 pounds this month), and discuss how to accomplish this. (See Morrison, 2007 for more tips about helping patients set goals to improve their health.) When a goal is chosen, help the patient overcome barriers to achieving it. Begin with simple tasks. Encourage weekly clinic visits to check blood pressure and review medications (explain the purpose of each medication and how to take it).

2. Dietary practices: Learn what the patient's dietary practices and food preferences are and assess his/her knowledge of nutrition. Provide information about good food choices and preparation methods, individually and in group settings. Use samples of packaged or canned food items commonly consumed to teach how to interpret nutrition information on labels (e.g., sodium content in ketchup).

3. Patient instruction: Explain hypertension and its risks in language the patient can understand. Use illustrations to facilitate comprehension. If giving written instructions, make sure the patient can read and understand them.

4. Portable information: Give patients a written summary of their latest test results that can be carried with them — e.g., a wallet-sized card specifying blood pressure measurement, creatinine glucose and potassium levels, weight, cholesterol and lipoproteins.

5. **Exercise:** Recognize that obese patients may develop other problems when attempting intensive weight-bearing exercise. Work with these patients to develop alternative forms of exercise to promote cardiovascular health, such as chair exercises, use of hand weights (books, soup cans, plastic bottles filled with water), and leg lifts [11-13].

MEDICATIONS

1. Diuretics: Although thiazide diuretics (HCTZ) are widely recommended as a first-line agents for Stages 1 and 2 hypertension, these medications can increase the risk of dehydration for persons living on the streets or in shelters in warmer climates, particularly during summer months. Diuretics are safe to use in most patients, but be aware that in combination with some of the anti-cholinergic drugs and lithium they can exacerbate dehydration.

2. Antihypertensives: Be cautious about prescribing beta-blockers or clonidine pills to homeless patients likely to have trouble with adherence, since discontinuing these medications suddenly can result in serious rebound hypertension. At initiation, beta-blockers can exacerbate depression. Be aware of the potential for clonidine to be sold on the streets in order to decrease the withdrawal effects of heroin and other opioids (nausea, cramps, sweating, tachycardia, and hypertension). If clonidine is contraindicated, explore alternative strategies to reduce high blood pressure.

3. Dispensing: Consider dispensing small amounts of medications at a time to ensure return for follow-up, recognizing the potential for lapses in adherence if obtaining prescribed medications is difficult for the patient. Homeless patients frequently lose medications if larger quantities are provided. Some patients sell their antihypertensive drugs; giving them a week's supply at a time can decrease this risk.

4. Dosing frequency: If once-a-day dosing is not possible to achieve blood pressure goals, use pre-filled medication boxes with daily slots which the patient can remove and carry with him/her. Recognize that shelters commonly require overnight residents to leave early each morning, with the doors opening again in the late afternoon. If medications are stored in a shelter, explain to shelter staff why some persons need to take medications more frequently than once a day.

ASSOCIATED PROBLEMS, COMPLICATIONS

1. Physical/cognitive limitations: Disabilities secondary to chronic illness or injury, frequently seen in homeless patients, can limit their capacity to follow a plan of care. Physical impairments, lack of facilities, and unsafe living environments may limit exercise alternatives. Cognitive deficits secondary to substance abuse, trauma, mental illness or medication side effects may limit understanding of the disease process and compromise adherence to treatment. Tailor the plan of care to patient needs and capacities.

2. Literacy/language limitations: A number of homeless people have difficulty reading but may not volunteer this information out of embarrassment or

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shame. They may be illiterate or have a low literacy level in their primary language and/or in English, if it is not their native tongue.

3. Multiple co-morbidities: Homeless people are at risk for myocardial infarction, stroke, and organ damage from uncontrolled CVD and comorbidities (emphysema secondary to smoking, cirrhosis of the liver secondary to alcoholism or hepatitis). Recognize and address lifestyle factors and barriers to treatment and self-care that increase risk for negative health outcomes.

4. Chemical dependencies: Be aware that substance use disorders, frequently seen in homeless patients, are medical problems that contribute to cardiovascular disease. Nicotine is the addictive drug most frequently used by homeless people. Smoking elevates blood pressure and pulse rate, contributing to heart attack and stroke. Excessive alcohol use can result in cardiomyopathy, which may lead to heart failure.

5. Lost, stolen medications: Living in shelters and on the street increases risk of medication loss, theft, or misuse. Consider dispensing smaller amounts of medications to improve adherence and allow for closer follow-up. Loss of medication can be a problem when public health insurance does not allow for replacement; use 340B Drug Pricing Program or other source of free/reduced-cost medications. Federally Qualified Health Centres are sometimes able to purchase medicines that are not covered by health insurance.

6. Transience: Recognize that the mobility of homeless patients may compromise continuity of care and make routine management of hypertension less likely than episodic, crisis care. Use positive incentives to encourage follow-up (e.g., food or coupons). Provide each patient with a pocket card listing latest test results, vital signs, and current medications to document medical history for the next care provider.

7. Lack of transportation: Homeless persons may be unable to return to the clinic due to lack of funds for transportation and/or disabilities that create additional barriers to use of public transportation. Assess for mobility impairment; provide required documentation to assist impaired patients in getting a mobility pass. Provide carfare to facilitate follow-up. Monitor blood pressure in the field, using outreach teams; network with fire departments and other agencies willing to check homeless people's blood pressure [14-16].

FOLLOW-UP:

1. Outreach, case management: Work with case managers and outreach workers to facilitate treatment adherence and follow-up care, including referrals to other facilities. Provide outreach to homeless shelters; invite residents to obtain needed screenings in clinic settings; offer a meal and transportation back to the shelter as incentives.

2. Frequency: Consider more frequent (monthly) follow-up visits to increase monitoring of blood pressure control and treatment adherence. Keep lines of communication open and encourage regular follow-up, even if the patient does not adhere to treatment. Don't be punitive; work with the patient to increase adherence by decreasing barriers to care.

3. Contact information: Verify contact information at every visit. Ask where the patient is staying (shelter, street or other locations where s/he usually sleeps or obtains meals) and how to contact (phone/cell number, e-mail address). Request address/phone number(s) of a family member/ friend/ case manager with a stable address to contact in an emergency. If the shelter has Community Voice Mail available, provide information about how to sign up for this service.

➢ CASE STUDY: HOMELESS ADULT WITH HYPERLIPIDEMIA

1. Presentation: 47 year-old homeless African American requests a blood pressure check.

2. Medical and family history: 10-year history of hypertension, no current medications due to transient living conditions. Unsure of medications used in the past. Denies history of cardiovascular disease, diabetes, cancer, asthma, hyperlipidemia, myocardial infarction, or chest pain. No hospitalizations. Positive family history for hypertension, cardiovascular disease, Type 2 diabetes, and drug/alcohol abuse, but no cancer.

3. Mental health/substance use history: Tobacco use: 20 pack-years. No desire to quit, as considers it a stress reducer while recovering from drug abuse. Weekly-to-monthly crack cocaine use for 7-10 years. 3-month (current) participation in residential drug/alcohol treatment program. No history of psychiatric illness [17-20].

4. Psychosocial history: Homeless for 10 years. Lost welfare benefits for nonadherence to work program requirements; current residential drug treatment program does not allow recipients to obtain welfare. Only social supports are "drinking buddies"; no family contact for years. Eats in soup kitchens/ shelters; walking moderate distances required to reach them.

5. Review of systems: Essentially benign except for positive dyspnoea on exertion and shortness of breath, which the patient attributes to his weight. No orthopnoea; able to sleep supine on 2 pillows. No cough, nausea, vomiting, diarrhoea, headaches, polyphagia, or visual changes. Admits to polydipsia and polyuria.

6. Physical exam: weight 240#, height 70", Body Mass Index (BMI) 34.4, percent body fat 42, abdominal girth 49", blood pressure 137/92, heart rate 72 (regular rate and rhythm). No edema in lower extremities, +3/4 pulses. All other findings within normal limits.

7. Labs: Fasting Blood Sugar (FBS) ↑160; total cholesterol ↑267; triglycerides ↑1107; High Density Lipoprotein (HDL) ↓ 23; unable to calculate Low Density Lipoprotein (LDL) due to high triglyceride level; cholesterol/HDL risk ratio ↑11.6; glycohemoglobin A1c 7.1; mean blood glucose 150. Liver function tests, creatinine, microalbumin normal.

8. Clinical assessment: Metabolic Syndrome (Type 2 diabetes mellitus, stage 1 hypertension [untreated], obesity, atherogenic dyslipidaemia); nicotine and cocaine dependence.

Doi: 10.2016-37245516/; DOI Link :: http://doi-ds.org/doilink/07.2020-72295186/

9. Plan of care: Treatment goals: for patient with Type 2 diabetes (CAD equivalent), LDL goal is <100; non-HDL cholesterol goal is <130. Rx: pravastatin 40 mg at bedtime, Slow-Niacin 500 mg twice a day, monopril 20 mg daily (available at no cost with minimal requirements through pharmacy drug assistance program). Consider beginning metformin 500 mg daily for diabetes, although lipid control expected to reduce glucose level; stress diet and exercise, recognizing need to reduce elevated triglycerides, and surveillance of possible end organ damage.

10. Aaron Strehlow, PhD, FNP-C, RN – UCLA School of Nursing Health Centre, Los Angeles, California, 2003

HYPERLIPIDEMIA IN HOMELESS ADULTS:

DIAGNOSIS AND EVALUATION:

HISTORY:

1. Living conditions: Lack of stable housing complicates health care and adherence to treatment. At every visit, ask where the patient is staying ("describe the place where you sleep"), where s/he spends time during the day, and how s/he can be contacted. Ask explicitly about access to basic needs (food, shelter, restrooms, and a place to store medications).

2. Medical history: Ask if the patient has ever been told s/he had hypertension, cardiovascular disease, coronary artery disease, diabetes, kidney or liver disease. Determine the patient's age, recognizing that many homeless adults appear to be older than their chronological age. Ask about current medications, including any drugs taken for mental health (which s/he may be reluctant to reveal), recognizing that some antipsychotic drugs elevate blood glucose and lipid levels.

3. Family history: Ask about individual/family history of hypertension, cardiovascular disease, coronary artery disease, diabetes, kidney or liver disease.

4. Social history: Inquire about the patient's cultural heritage, recognizing that food preferences of particular cultural/ethnic groups, including Hispanics, African Americans, can be very high in saturated fat and sodium.

5. Diet: Ask the patient to describe what s/he eats and drinks over a 24-hour period. Ask specifically about foods high in cholesterol, saturated fats or sodium, and about beverages containing alcohol or caffeine. Ask where the patient eats (e.g., soup kitchens, shelters, missions), types of food typically served, how foods are prepared, and whether salt is added.

6. Activity level: Ask the patient to describe his/her usual physical activities (e.g., walking—how far in blocks?). Knowledge of activity level can be useful in designing an exercise program.

7. Smoking: Ask whether and what the patient smokes. Smoking is more common among homeless than domiciled people and often begins at a younger age. Homeless persons are known to use inexpensive brands of cigarettes that are especially high in tar/nicotine, and often smoke other substances that may increase their risk for cardiovascular disease. They may also reuse cigarettes (pick up cigarette butts from streets/gutters) and use non-traditional "rolling paper" (such as newspaper) that may contain more toxins than standard brands [21-22].

PHYSICAL EXAMINATION

1. Standard exam: Measure the patient's height, weight, Body Mass Index, percent body fat, abdominal girth, blood pressure, and heart rate; perform carotid ausculation for a bruit, cardiac auscultation for an S4; check peripheral pulses.

2. Lower extremities: Look for swelling in lower extremities; try to differentiate dependent edema from swelling due to heart failure.

3. Dermatological exam: Examine the skin for acanthosis nigricans and skin tags, which are prevalent in metabolic syndrome.

4. Oral exam: Look in the patient's mouth for plaque and calculus, which are comparable to HDL, LDL and total cholesterol values as indicators of cardiac health (Janket, 2004). Be aware that certain medications, (e.g., calcium channel blockers, blood thinners).

DIAGNOSTIC TESTS

1. In Outreach settings or clinics with limited access to a formal laboratory: Perform finger stick glucose checks, cholesterol screens, urine dips.

2. Liver function tests (LFTs): Assess for liver disease, especially in persons using alcohol or with a history of injection drug use. LFTs should be monitored in patients on statins, which can exacerbate pre-existing liver disease. Consider continuation of treatment until LFT's are 2–3 times normal limits barring other complications. Recognize that many homeless people have hepatitis. Question homeless patients routinely about behaviours that place them at high risk for hepatitis B and C, but reserve laboratory screening for those meeting risk-based indications for testing, to minimize false-positive test results and attendant costs to clarify results.

3. Cognitive assessment: Regularly assess for cognitive impairment related to long-term alcohol/drug use or normal aging, which may affect adherence to treatment regimens. The Mini-Mental State Examination (MMSE) is a widely used assessment tool for adults.

4. Test results: Make it easy for patients to get test results. Use case managers to facilitate their return to the clinic for results and further treatment.

PLAN AND MANAGEMENT:

PLAN OF CARE:

1. Lipid goals: Use the standard formula to calculate cholesterol and triglyceride goals. Although achieving these goals can be more challenging when treating individuals who are homeless, the same standard of care applies to all patients.

2. Adherence: Help the patient to understand the importance of adhering to the plan of care, recognizing that hyperlipidemia is an asymptomatic disease and that people with high blood cholesterol/triglycerides usually feel fine [23, 24].

Doi: 10.2016-37245516/; DOI Link :: http://doi-ds.org/doilink/07.2020-72295186/

EDUCATION, SELF-MANAGEMENT:

1. Self-management goals: Help the patient develop self-management goals, including strategies to promote weight loss and reduce intake of fatty acids and cholesterol. Set goals in collaboration with the patient.

2. Exercise: Encourage aerobic exercise and give examples that are feasible for the patient (e.g., "Walk from 1st street to 6th street and back, which equals a mile; or walk up and down 4 flights of stairs.") Explain that walking may help to decrease swelling of the legs and feet.

3. Diet/nutrition: Give examples of healthy dietary choices in settings where the patient obtains food — e.g., encourage extra servings of vegetables and fruits instead of fatty meats. Discuss portion control ("Eat half of what is on your plate").

4. Patient instruction: Use simple language and graphic illustrations to explain what high cholesterol is and how it affects the blood vessels and heart.

MEDICATIONS:

1. Simple regimen: Use the simplest medical regimen possible to facilitate treatment adherence — e.g., daily dosing of medications, taken at bedtime or with the evening meal. Prescribe medications that are appropriate and available to the patient.

2. Statins: Clinical research indicates that "statins" (hydroxymethyl glutaryl coenzyme A reductase inhibitors) may worsen health outcomes in persons with chronic transaminiase elevations secondary to hepatitis B or C, and in chronic alcohol users. Use clinical judgment in prescribing statins for these patients, considering risks and benefits of using these medications. If statins are prescribed, consider continuation of treatment until LFT's are 2–3 times normal limits barring other complications. Recognize that many of the statins are available at reduced price through large retail pharmacies. As an alternative to statins, consider using niacin (vitamin B3) as an effective and less expensive way to lower LDL cholesterol and increase HDL cholesterol [23-25].

ASSOCIATED PROBLEMS, COMPLICATIONS

1. Liver disease: High rates of alcoholism and hepatitis, two major causes of cirrhosis, have been reported in some homeless sub-groups, including injection drug users. High risk for liver damage may influence the choice of lipid-lowering medications. Monitoring liver function at baseline and one to three months following initiation of statin therapy is especially important for patients whose risk for liver disease is high.

2. Myopathy/ rhabdomyolysis: Monitor serum creatine kinase (CK) levels routinely only in patients at high risk for myopathy, including those with a history of alcohol/drug abuse or hepatitis. Be aware that medications including the antidepressant nefazodone and some HIV medications can also increase myopathy risk, as can uncontrolled seizures.

3. Physical/cognitive limitations: Disabilities secondary to chronic illness or injury, frequently seen among homeless people, can limit their capacity to follow a plan of care. Physical impairments, lack of facilities, and unsafe living environments may limit their exercise alternatives.

4. Literacy/language limitations: Some homeless people have difficulty reading but may not volunteer this information out of embarrassment or shame. They may be illiterate or have a low literacy level in their primary language and/or in English, if it is not their native tongue. Assuming erroneously that patients can read directions on medicine bottles or appointment cards can lead to serious complications and loss to follow-up [26].

FOLLOW-UP

1. Outreach, case management: Work with case managers and outreach workers to facilitate treatment adherence and follow-up care, including referrals to other facilities. Provide outreach to homeless shelters; invite residents to obtain needed screenings in clinic settings; offer a meal and transportation back to the shelter as incentives.

2. Frequency: More frequent (weekly/ biweekly/monthly) visits are warranted for homeless patients to increase rapport, monitor associated problems (such as elevated LFTs), reinforce understanding of the plan of care, and identify/promptly address complications of treatment or problems with adherence. Some homeless patients are more likely than others to develop complications due to poor general health and alcohol/drug use.

3. LFTs: Monitor liver function regularly after statins are begun.

4. Contact information: Verify contact information at every visit. Ask where the patient is staying (shelter, street, other locations where s/he usually sleeps or obtains meals) and how s/he can be contacted (phone/cell numbers, e-mail address). Request the address/phone number of a family member, friend, or case manager with a stable address to contact in an emergency. Provide information about how to sign up for Community Voice Mail, if available [27].

➢ CASE STUDY: HOMELESS MAN WITH HEART FAILURE:

1. Presentation: J.M. is a 64-year-old, obese, Hispanic male referred to clinic for "painful swollen ankles." He reports his "sore legs" and "hard breathing" make it difficult to walk very far, admits he is tired after one block. He sleeps in a park, and often gets up at night to urinate. He admits he is sometimes not able to make it to the bathroom, which is on the other side of the park.

2. Review of systems: In addition to symptoms above, admits to fatigue. Denies chest pain, orthopnea, paroxysmal nocturnal dyspnea, polydipsia or polyphagia.

3. Medical history: J.M. has a history of high blood pressure, but has not taken medication consistently. He has visited 3 different emergency rooms in the last 2 months for "asthma" and was hospitalized once for "about a week." He does not have a primary care provider, stating that he goes to the emergency room

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when he "can't take it anymore." He reports one other hospitalization, 10 years ago, after having "heart trouble." His medication bottles are from multiple providers, with multiple medications in one bottle and empty bottles elsewhere. He denies history of diabetes and is not sure about his cholesterol; unsure of any family history.

4. Mental health/substance use history: J.M. has a history of schizophrenia for which he does not take medication. He smokes one pack of cigarettes per day. He denies drugs, but admits to binge drinking, with 1-2 month periods of abstinence between binges.

5. Physical Exam: Patient is dishevelled, appears older than stated age. Blood pressure 170/94; respiratory rate 22-24; pulse ox 96%, pulse 90 and regular; temperature 98.6; weight 262 lb, height 5' 7", BMI 41. Pertinent positives on PE: dry cough, distended jugular veins, rales on auscultation, laterally displaced apical impulse with an S3 gallop, hepatomegaly, protuberant abdomen, lower extremity edema (+2) to knees.

6. Diagnostic Tests: Urine dipstick, complete blood count (CBC), thyroid test (TSH) and cholesterol panel all normal, HIV negative. The complete metabolic panel (CMP) showed non fasting glucose 212 (elevated), but was otherwise normal (including normal renal and liver function). EKG consistent with combined ventricular hypertrophy, right and left.

7. Assessment: Heart failure (clinical findings consistent with left and right-sided heart failure); hypertension; obesity; untreated schizophrenia; nicotine dependence; alcohol dependence, binge pattern; elevated glucose – rule out diabetes.

8. Plan of Care: Prescribe furosemide and lisinopril once daily to simplify adherence; advise to take diuretic early in the morning to avoid night time urination. Local homeless day centre identified where patient can have access to bathroom. Shelter bed located and a note was written to shelter staff requesting bed close to bathroom. Patient advised to sit on a chair/bench with legs elevated, when possible. Referrals for alcohol treatment and mental health evaluation offered, but patient declined. Encouraged return to clinic for frequent follow-up, using positive incentives (e.g., food, socks, transportation assistance) [28].

HEART FAILURE IN HOMELESS ADULTS:

DIAGNOSIS AND EVALUATION:

HISTORY:

1. Living conditions:

Ask patients where they are living and where they eat their meals. Ask where they slept last night and whether this is the place where they usually live,

2. Medical history:

Ask specific questions about prior heart or lung disease (e.g., Have you ever had a heart attack?), which may give clues to the etiology of heart failure. Be aware that substance users may be reluctant to relate medical history if they have been told they have cardiomyopathy related to drug or alcohol use.

3. Alcohol/drug use:

Assess for use of drugs that may affect the heart, such as cocaine, amphetamine, and alcohol. Recognize that use of alcohol and/or cocaine may lead to cardiomyopathy, a known cause of heart failure; injection drug use may predispose to infections of the heart valve and other structures, which may eventually present as heart failure.

PHYSICAL EXAMINATION

1. Heart /chest:

Perform a thorough cardiac exam. Check for PMI, heave, barrel chesting. Palpate radial pulses for bounding.

2. Lungs:

Although rales are the traditional sign of heart failure, recognize that wheezes or rhonchi may be the overt physical finding in patients with chronic obstructive pulmonary disease (COPD) and heart failure. Homeless people are more likely to have concomitant COPD from smoking. Take all the time you need to perform a thorough cardiopulmonary.

DIAGNOSTIC TESTS

1. Baseline CXR & EKG:

Despite their low sensitivity and specificity, chest X-rays and electrocardiograms are recommended tests for the initial evaluation of all patients suspected of having heart failure. Pay attention to cardiomegaly, prior myocardial infarctions (MI), left ventricular hypertrophy (LVH), and cardiac arrhythmia. EKGs may be difficult to interpret because of the lack of prior tracing for comparison in this highly mobile population.

2. Echocardiogram:

Obtain an echocardiogram. A stress test is often indicated to assess for coronary artery disease. For patients who cannot tolerate an exercise stress test, the cardiologist may choose to order a chemical stress test.

3. Test results:

Make it easy for the patient to get test results. Use case managers and outreach workers to facilitate return to the clinic for results and further treatment.

PLAN AND MANAGEMENT:

PLAN OF CARE:

1. Underlying disease management goals:

Try to determine the etiology of heart failure (e.g., alcohol/drug-related, HIV, CAD, hypertension, right-sided heart failure secondary to lung disease/smoking) in order to design the most effective plan of care. Homeless people often have several underlying disease processes that contribute to stresses on the heart.

2. Adherence:

At the end of every visit, discuss the plan of care with the patient; ask if anything about it is unclear or difficult, and work with him/her to address obstacles to adherence [29].

Doi: 10.2016-37245516/; DOI Link :: http://doi-ds.org/doilink/07.2020-72295186/

EDUCATION, SELF-MANAGEMENT:

1. Self-management goals:

Work with the patient to develop self-management goals appropriate to the etiology of heart failure. Ask the patient what s/he would like to work on. Set goals in collaboration with the patient and offer an incentive (e.g., food or coupons) at the next follow-up if improvement is noted.

2. Diet/nutrition :

Teach the patient how to restrict dietary sodium to as close to 2 grams per day as possible; remind him/her not to add salt to foods and to eliminate foods with high sodium content, such as potato chips and salt-cured meats. Advocate for more nutritious food choices in shelters and soup kitchens. Refer the patient to a nutritionist, preferably on the clinical team, who is familiar with the limited food choices that homeless people typically have.

3. Fluids:

Some patients may need fluid restriction. It helps to express amounts in terms the patient can understand: use the patient's own water bottle and specify how many full bottles to drink each day. Understand that individuals who are mainly outdoors may need more liberal amounts of fluids during hot weather.

4. Weight measuring:

Teach patients how to check their weight properly, and explain the implications of weight gain along with worsening symptoms. Allow patients to check their weight in the clinic without excessive waits.

5. Substance use:

Explain that use of alcohol and other addictive drugs can cause further damage to the heart.

MEDICATIONS:

1. Simple regimen :

Current medication recommendations are outlined in the ACC/AHA Stages of Heart Failure. This staging system emphasizes the progressive course of heart failure. Choosing the appropriate medications must also take into account the individual patient's situation. Cardioprotective beta-blockers such as Carvedilol or Metoprolol are often prescribed to decrease the work of the heart muscle. Use the simplest medical regimen possible to facilitate treatment adherence. Use whatever medications are appropriate and available to the patient, considering medication expense, side effects, and duration of treatment.

2. Diuretics:

Even though diuretics are standard treatment for heart failure, they can be difficult for homeless persons with limited access to bathrooms. Use alternative medications as appropriate. Be aware that diuretics can exacerbate dehydration, particularly in warmer climates.

ASSOCIATED PROBLEMS, COMPLICATIONS:

1. Medication toxicity:

Check medications prescribed elsewhere that may exacerbate heart failure. e.g., nonsteroidal anti-inflammatory drugs (NSAIDs), cyclooxygenase-2 inhibitors, calcium channel blockers (especially diltiazem and verapamil), diabetes medications such as metformin or thiazolidinediones.

2. Edema:

It is not unusual for homeless people to be literally on their feet all day or sleep sitting up when a bed is not readily available, resulting in dependent edema that may mask or exacerbate swelling of the lower extremities secondary to heart failure. If the patient has no place to elevate his/her feet during the day, recommend sitting on the ground to decrease swelling. For patients with edema living in their car, suggest lying down on the seat with their legs elevated on the back of the seat [30-31].

FOLLOW-UP:

1. Outreach, case management:

Work with case managers and outreach workers to facilitate treatment adherence and follow-up care that may include referrals to other facilities. Provide outreach to homeless shelters; invite residents to obtain needed screenings in clinic settings; offer a meal and transportation back to the shelter as incentives. Always have a card with the clinic location, phone and hours of operation available to give to patients [31-33].

2. Frequency:

Consider more frequent (weekly/biweekly/monthly) follow-up visits to monitor weight, possible complications, and treatment adherence. Swollen feet and fluid in the lungs may indicate that the patient is not taking medications regularly. Keep lines of communication open and encourage regular follow-up, even if the patient does not adhere to the plan of care.

CONCLUSION:

Now on the basis of this report it will be very familiar with cardiovascular diseases, their development and their diagnosis. It can also know their treatment and many of the cardiovascular disease risk factors – what they are and how they can be influenced positively to minimize cardiovascular diseases. It has been understand the overall importance of a balanced diet, regular exercise and weight management (guided by adiposity measurements) throughout life, to maintain cardiac and vascular health.

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