Chest Pain Management

Göğüs Ağrısı Yönetimi

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ABSTRACT

Chest pain is a frequent symptom witnessed in emergency (ER), internal medicine polyclinics, and family practice departments. The underlying reasons might range from myalgia, psychogenic pain to acute myocardial infarction and pneumothorax. If it is underestimated and not examined painstakingly investigated, it can lead to serious morbidity and mortality. Therefore chest pain management is of utmost importance.

Keywords: *Chest pain, emergency unit, management*

ÖZET

Göğüs ağrısı, acil servis başvurularında, aile sağlığı merkezlerinde veya dahiliye polikliniklerinde sıklıkla rastlanan semptomlardan biridir. Altta yatan sebep miyaljiden psikolojik ağrıya, akut miyokard enfarktüsünden pnömotoraksa kadar uzanan bir yelpazede görülebilir.Altta yatan nedenin önemsenmemesi ya da gözden kaçırılması durumunda ciddi mortalite ve morbidite sonuçları olacaktır, bu sebeple göğüs ağrısı yönetimi oldukça önemlidir.

Anahtar Kelimeler: *Göğüs ağrısı, acil servis, yönetim*

INTRODUCTION

Pain has been defined as an unpleasant sensory or emotional experience accompanying existing or probable tissue damage, or described in terms of such damage. If we examine occurrence mechanism of chest pain, afferent pain fibers are into two forms which are somatic fibers and visceral fibers. Skin and parietal pleura has somatic innervations and internal organs such as esophageal blood vessels have visceral innervations. Pain receptors are present on the parietal pleura while they are not present or very few on visceral pleura.

Impulses from receptors are carried to medulla spinalis, dorsal horn cells and from there to brain via spinothalamic and reticular spinal tract. Pleuratic pain is the most characteristic pain type of the respiratory tract and caused by parietal pleura and endothoracic fascia (1). Pain is generally local. It sometimes may spread along the course of intercostal nerve of effected zone. It is a sharp pain.

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Deep breathing, coughing, laughing and pressure on intercostals space increase the pain. Expiration breath-hold reduces the pain.

The diaphragmatic surface of parietal pleura is innervated by the phrenic nerve in its central portion and by the intercostals nerves in its other portion. Pain reflects to shoulder and neck when central portion of the diaphragmatic pleura is affected.

A good approach to chest pain is crucial, because according to the data of the World Health Organization, ischemic heart disease ranks first as a cause of death in the leading diseases. The important thing in chest pain is to determine life-threatening situations and low-risk patients. Therefore, it is very crucial to take a detailed history in distinctive diagnosis of chest pain.

The onset and duration of chest pain, location and radiation, intensity, its relationship with movement and breathing, other symptoms associated with disease must be studied. For a rapid clinic assessment in emergency cases, medical history must be taken briefly and directly, and review of basic findings/symptoms such as general view, vital symptoms, and the status of jugular vein, chest auscultation and peripheral artery palpation in physical examination might be sufficient for the first intervention (2). After getting emergency cases under control, anamnesis and physical examination must be made in detail. Ratio of people presented with chest pain to the emergency department is approximately 5% (3). Although first cardiac reasons come into our minds for the most of them, it constitutes only 30%.

Musculoskeletal diseases, gastrointestinal diseases, stable coronary artery disease, panic disorders and other psychiatric disorders, respiratory system diseases are generally major diseases of people consulting the family physicians due to the complaint of chest pain in the first step (4).

Those over the age of 40 having the history of smoking and having comorbid diseases such as diabetes mellitus and hypertension should not underestimate the chest pain and must have preliminary survey conducted for further probable diagnosis.

For the true diagnosis in the assessment of chest pain, medical personnel must be experienced, laboratory testes must give correct results and we must know which laboratory test for which patient well. The results obtained must be commented thoroughly and properly.

When patient seeks medical advice, anamnesis must be received very quickly and properly, after physical examination accordingly, EKG and PA Chest X-Ray must be taken very quickly. In history of pain, OPQRST inquiry can be made. O-What (onset, origin) were you doing at the time of pain? Have you ever had similar complaints) P -What provokes your symptoms? What makes it better? What makes its worse? Q-(Quality) what the pain feels like? Is it sharp? Or obtuse? Or tearer? (R Region) Where is your symptom and where does it radiate? Is there more than one point? S (Severity) if scoring the pain, on a scale of 1 to 10, how would you rate your level of pain? T (Time) when did the pain first begin? When did it finish? How long did it take? (5). EKG must be taken with 12 derivations. It must be kept in mind that the first EKG can be normal. Therefore, we must be very careful for patients about whom the MI is supposed. Cases such as myocarditis, cardiomyopathy, pneumonia, esophagospasm, are those not including ST segment elevation which may follow acute coronary syndrome. Patients with acute coronary may sometimes seek medical services for atypical symptoms such as indigestion, dyspnea and stinging pain (6).

First of all, a radiological P-A Chest X-Ray is required from patients who presented with chest pain to the emergency department or polyclinic. If x-ray is insufficient for diagnosis, CT-Scan will be required. In

case CT-Scan has contraindications, MRI can be preferred as an imaging method (7).

Chest pain may sometimes confront us very intense in some diseases. From them, ischemic chest pain, pulmonary embolism, aortic dissection, pneumothorax and pericarditis are major ones (8).

We may divide cardiac pain into two; the ischemic pain and the non-ischemic pain. Coronary artery diseases, aortic stenosis, hypertrophic cardiomyopathy, systemic and pulmonary hypertension are the main reasons among leading ischemic reasons, and aortic dissection is the most important among non-ischemic reasons. It is followed by pericarditis, aortic aneurysm and mitral valve prolapse. There is an obtuse and tightening pain is ischemic angina, while beginning of pain is rather progressive and substernal in terms of localization. Type of pain in non-ischemic angina is sharp and its beginning is sudden and on the lateral chest wall in terms of localization. Nausea, pain on the left arm, gnathalgia, dyspnea and perspiration are accepted as symptoms equivalent to angina. Acute coronary syndrome; is classified as q wave myocardial infarction, non q wave myocardial infarction, unstable angina pectoris and acute sudden ischemic death. Clinicians should be encouraged to think about the posibility of microvascular dysfunction or coronary microvascular spasm in patients who present with typical angina despite having angiographically normal coronary arteries (9). Increase of troponin-t or troponin-i in myocardial infarction after 5-72 hours is a crucial laboratory analysis. Use of new biomarkers such as miRNAs alternative to troponin is yet on trial (10).

Pulmonary embolism is a blockage of the pulmonary artery and its branches with venous thrombosis travelling from systemic veins. It is closely associated with deep venous thrombosis. 90% reason of the pulmonary embolism is DVT. It is main results of venous stasis known as Wirchov's triad, hypercoagulability and local intaluminal damage creation on blood vessel wall. 50% of patients die in the first 30 minutes, 70% in the first 60 minutes and 85% in the first 6 hours. Mortality reduces with the starting of treatment. Mostly, suspect means diagnosis and is a sufficient criteria to start a treatment Therefore, it is very vital to consider pulmonary embolism for patients with side pain and dyspnea together with pleuritic chest pain. Pulmonary embolism has a wide range of clinical presentations, with chest pain present in only 75% of cases. Westermark sign on P-A Chest X-ray; is an extension in the shade of pulmonary artery together with oligemia in the lung zone. Hampton Hump; is one or more pleural based, wedge-shaped densities. Observation of these findings is important in respect of reminding pulmonary embolism. D-dimer measurement is crucial in laboratory analysis. It is constituted as a result of fibrin-mediated fibrin proteolysin in a medium constituted by thrombus. Being negative eliminates diagnosis. However, the 3-month risk of venous thromboembolism (VTE) is sufficiently high in the setting of a negative D-dimer test (3, 5% and 21, 4%, respectively) to warrant further imaging given the life-threatening nature of this condition if left untreated. It is very frequently used laboratory analysis in daily practice. CT anjiography (with helical or multidetector CT imaging) has replaced ventilation-perfusion scanning as the preferred diagnostic test for pulmonary embolism, having aproximately 90-95% sensitivity and 95% spesifity for detecting pulmonary embolism (compared with pulmonary angiography) (11).

Chest pain confronts us in aortic dissection presents with the sudden onset pain radiating to the back and there is an uninterrupted chest pain. And neurologic symptoms may associate with that. Newly emerging murmur in physical examination and Upper extremity nonequal tension arterial measures is determined. Adjuvants are radiological analyses in P-A chest x-ray and BT angina diagnosis

Pneumothorax is the collection of air in the pleural space due to several reasons. Pneumothorax may confront us spontaneously or traumatically. Chest pain in pneumothorax has pleuritic type, sudden onset, and dyspnea accompanies the pain. It frequently occurs in young, tall and smokers. Physical treatment provides finding in large pneumothorax. There are reduced breath sounds. Tachycardia is the most frequent symptom. Although there are nonspecific symptoms and findings related to pneumothorax, diagnosis requires chest x-ray that confirms suspect (12).

Chest pain on pericarditis is positional and is generally pleuritic type. Form of the pain is like a stitch. Pain generally intensifies when lying on the left side and back and with each heartbeat. Intensification of pericardial pain with breathing is generally dependent on inflammation of the adjacent pleura. With typical EKG changes, it may differ from pleural or skeletal pain.

Chest pain shall confront us as a common symptom, because of chest wall and pleural invasion by primary tumor in lung cancers. More than 50% of patients with lung cancer complaint about chest pain during the observation of patients. If it is at the diagnosis stage, chest pain occurs in more than 20 % patients with non-small cell lung cancer because of direct and metastatic involvement of thorax structure sensitive to pain (13). Those applying to the emergency department due to chest pain depending on lung cancer are approximately 2%. Because there is no nerve causing pain in the lung parenchyma, chest pain does not occur in most lung cancers at the beginning. However, because there are nerves perceiving pain at pleura that lines the inside of the rib cage, pain emerges due to reasons caused by chest wall. A side pain is seen which is obtuse, continuous and does not change with breathing and coughing. In general, such a pain may develop depending on mediastinal pleura or chest Wall involvement or rib metastasis. And pleuritic pain is seen 8-15% of lung cancer patients and it is directly supposed to be due to pleural involvement, obstructive pneumonia or hypercoagulability. When pleural effusion develops, pleuritic chest pain shall disappear and dyspnea begins (14).

To explain briefly other diseases that cause chest pain, reflux is also frequently among gastrointestinal origin application reasons to emergency department due to chest pain. In reflux, substernal burning is accompanied by epigastric discomfort. It appears after meals and the pain which increase when lying on back will be relived by using antacid. Esophagospasm, reflux esophagitis, peptic ulcer and esophageal rupture are also among gastrointestinal origin reasons (15). Anxiety, depression and cardiac neurosis confront us among main psychogenic reasons. Chest pains are usually described behind heart. However that described pain is not a typical chest pain. Pain is not related to exercise of movement. Other symptoms of emotional disorder are in the forefront. They are usually treated by antidepressant drugs. Use of banned substances such as cocaine may lead to acute chest pain (16). Sarcoidosis secondary lymphadenopathy, mediastinitis and lymphoma confront among main reasons of mediastinal disease. In pains depending on chest wall, pain level shall increase together with breathing. Tietze's syndrome and thoracic outlet syndrome are also important chest pain reasons caused by the chest wall. There is a dermatomal zone localized patch in thoracic herpes zoster. Vascular rash is observed. Pain in costochondritis from musculoskeletal disorders is sudden onset and intense, and there is also temperature increase and swelling in joint. Sometimes desmoid tumor located in the chest wall can become appearant with chest pain in the fibromatosis (17).

In conclusion, chest pain should not be underestimated and examined in detail by doctors in patients who apply to clinic due to chest pain. Because it causes serious morbidity and mortality, all the further studies should be made, if needed.

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