

Discussion about Cardiogenic Thoracodynia

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ABSTRACT

This paper represents Thoracodynia diseases, mainly Cardiogenic Thoracodynia. Using symptoms of Cardiogenic Thoracodynia, rapid and accurate differential diagnosis is difficult when focus Cardiogenic Thoracodynia. According to senior physician's demonstration on clinical cases in undergraduate practical sessions, and post learning afterwards base on literature review. Finally, this paper has been written and extends further understanding of Cardiogenic Thoracodynia in the future.

KEYWORDS

Cardiogenic; Thoracodynia; etiology; clinical manifestation; diagnosis; preliminary treatment

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INTRODUCTION

Thoracodynia mainly refers to the pain and discomfort in the anterior thoracic area. Patients often complain of stuffy pain, contraction, burning, acupuncture like pain, pressing, tearing like pain, knife cutting like pain, and some indescribable symptoms [1, 2]. The location of thoracodynia generally refers to the range from the neck to the lower end of the thorax, and sometimes it can radiate to the maxillofacial region, teeth and throat, shoulder and back, both upper limbs or upper abdomen [1, 2]. Thoracodynia is caused by stimulation of innervating trachea, bronchus, heart and aorta of nerve endings, including radiation pain; the causes of thoracodynia are often inflammatory lesions, ischemic lesions, tumors, trauma, mechanical compression, physical and chemical factors, autonomic nerve dysfunction, reflection or involvement of adjacent organ lesions, etc. [3].

There are 1% - 2% of outpatients are thoracodynia [4]. Although most thoracodynia patients are non-cardiac, heart disease remains the leading cause of death in United States [4]. Therefore, it is necessary to judge the severity, benign and malignant causes of thoracodynia, and it is also very important to diagnose and predict problems when making judgment [4].

Thoracodynia is one of common clinical symptoms, in addition to thoracodynia caused: obvious trauma, thoracic wall diseases, thoracic organ diseases, articulation homer and surrounding tissue diseases [5]. There are a few patients with thoracodynia, would be able to prone to diagnostic confusion or misdiagnosis; but caused by costal cartilage calcification is one of them clinically, after more than ten years of comparative analysis of clinical and imaging features of such cases, we obtained the above views [5].

Characteristics of thoracodynia

- Pain inducement
- Pain site
- Nature of pain
- Pain duration
- If any radiation pain or complications

Etiology of thoracodynia

- Cardiogenic
- Pulmonary origin
- Aortic dissection
- Gastrointestinal origin
- Banded scar rash
- Unclear reasons, etc.

Thoracodynia is pain in the thorax and anocelia, common diagnosis: skin herpes zoster, costochondritis of thoracic wall, shoulder disease, intercostal injury, spinal nerve root compression, breast focus, malignant metastasis of thoracic wall, pulmonary pneumothorax, pulmonary embolism, pneumonia, pleural disease, connective tissue disease and malignant tumor [7].

Thoracodynia is a common cause for patients to visit emergency department, conditions are complex, often involving multiple organs and systems, and severity of condition is different. Its curative effect and prognosis are obviously time-dependent [8].

CARDIOGENIC THORACODYNIA

The etiology of male and female emergency non-traumatic thoracodynia is mainly cardiogenic thoracodynia [6]. The proportion of male patients with older age is higher than women, and most have a history of smoking and drinking, these particular patients should be treated timely and accurately base on the characteristics of disease in the process of clinical diagnosis and treatment [6].

Sometimes, some people have transient pain within thoracic area, they might highly suspicious of angina pectoris or coronary heart disease [9]. Angina pectoris must be identified and processed in a timely manner, it may develop into myocardial infarction if more than 15 minutes [9]. However, there are not all thoracodynia is angina pectoris, angina pectoris is most common among men over 40 years old and postmenopausal women, especially those with hypertension, diabetes, hyperlipidemia and smoking; family history of coronary heart disease, myocardial infarction, hypertension, diabetes and hyperlipidemia is also a high-risk group [9].

For patients with cardiogenic thoracodynia, the application of pre hospital first aid and emergency accompany nursing, blood oxygen saturation, heart rate, diastolic blood pressure and systolic blood pressure can effectively improve efficiency of nursing, which is worthy clinical promotion [23].

When judging the possibility of cardiogenic thoracodynia about patients in emergency, the diagnosis rate can be improved according to the patient's pain score, MEWS score, SpO value and age. This diagnosis and treatment of method can be widely used in clinic [25].

Exertional thoracodynia, recurrent thoracodynia, hypotension and unstable ECG activity have importantly guiding significance for rapid triage of patients with cardiogenic chest pain (CCP) [37].

Patients with cardiogenic acute thoracodynia are older, and have more complications; combined with the nature of pain and accompanying symptoms, it is helpful to early making judgement of the type in acute thoracodynia; patients with high-risk thoracodynia should be identified as soon as possible to improve the effectiveness of treatment [39].

Heart score provides a simpler, faster and more reliable assessment method for the condition and prognosis of patients with thoracodynia in clinical emergency; compared with the traditional global acute coronary event registration score (GRACE), the former is more accurate and easier to operate, and is suitable for emergency [41].

DISCUSSIONS

Among the causes of acute thoracodynia, cardiogenic for 35% (mainly acute myocardial infarction and unstable angina pectoris), and non-cardiogenic for 65%; the thoracodynia center model can significantly shorten the diagnosis and treatment time of patients with acute thoracodynia [42].

The early symptoms of esophageal cancer are not typical. It is difficult to distinguish from cardiogenic thoracodynia such as coronary heart disease and angina pectoris, in order to misdiagnosis and mistreatment base on chest pain as prominent symptoms [10].

In patients with malignant tumor and thoracodynia, the diagnosis and differentiation of cardiogenic thoracodynia are carried out, and some patients are treated according to the risk of cardiogenic thoracodynia, which has good curative effect and can reduce the medical risk [70].

High sensitivity-C-reactive protein (hs CRP), troponin I (TPI) combined with heart scoring system is conducive to the qualitative diagnosis and risk stratification of acute cardiogenic thoracodynia, and has high predictive value for the occurrence of mace in patients in the short term [21].

Calcium sensitive receptor has better value than cTnI in the diagnosis of acute myocardial infarction within 4 hours of thoracodynia [11].

Patients with thoracodynia accompany negative coronary angiography cannot find a clear cause of physical disease after repeated examination; they are collectively referred to as nonspecific chest pain (NSCP) [12]. At present, there is no effective method to identify NSCP, which is mainly excluded by coronary angiography, but coronary angiography is invasive and expensive [12].

The mental health status of coronary heart disease patients with recurrent thoracodynia after PCI and CABG is relatively poor. The main problems include more negative emotions, weakened cognitive function and low self-evaluation when formulating the comprehensive rehabilitation plan for patients with coronary heart disease, it is necessary to add targeted psychological intervention [13].

For emergency patients with thoracodynia, the risk of cardiogenic thoracodynia should be comprehensively judged in combination with age, MEWS score, pain score and SpO₂ to avoid missed diagnosis [22].

The optimized nursing mode can improve the application effect of stent implantation in patients with acute cardiogenic chest pain, which is worthy of wide clinical promotion [43]

Color Doppler ultrasound and ECG are used to detect and distinguish cardiogenic thoracodynia, with high sensitivity and positive predictive value, which can be popularized and applied in clinical diagnosis in the future [44] [52].

95% of patients with acute cardiogenic thoracodynia can be clearly diagnosed within about 3 hours by asking medical history, physical examination, auxiliary myocardial enzyme, troponin, ECG and echocardiography; among which ECG is key examinations what emergency doctors need to be vigilant about; in the fact that acute thoracodynia caused by myocardial infarction, thoracoabdominal aortic aneurysm, severe arrhythmia and pulmonary embolism can suddenly stop heartbeat and breathing during interrogation [51]. ECG can be used as the first choice for screening process of acute cardiogenic thoracodynia, which is simple, convenient and objective [51].

Patients with thoracodynia in emergency department had cardiac chest pain (CCP), non-cardiac chest pain (NCCP) [26]. The age of CCP patients was higher than NCCP patients, and males were more than females; in emergency treatment of patients with thoracodynia, elderly patients should be paid attention to [26].

RDW is closely related to prognosis of patients with acute cardiogenic paid to within 30 days. It can be used as an early risk stratification index for patients with acute cardiogenic paid to, accurately distinguish high-risk groups and formulate effective treatment strategies [34].

Among triple indexes of myocardial infarction, cTnI and CK-MB can effectively identify whether patients with cardiogenic thoracodynia receive emergency PCI or not, which is worthy of confirmation by larger multi center studies [35].

In the process of diagnosing patients with acute cardiogenic thoracodynia, myocardial enzyme level detection combined with multi-slice spiral CT has high diagnostic value and is worthy of application [36].

The improved heart score can accurately and quickly evaluate the condition and prognosis of patients with AMI and cardiogenic thoracodynia; it can be used as a quantitative index and is of great significance in making treatment decisions for patients with AMI and cardiogenic thoracodynia [54].

As an index of myocardial ischemia, ischemia modified protein can be used to distinguish cardiogenic thoracodynia from non-cardiogenic thoracodynia in the early stage of chest pain Ima > 68.3u/ml should be considered as the diagnosis of cardiogenic thoracodynia [61] [71].

TIMI risk score has good sensitivity in screening patients with acute cardiogenic thoracodynia and is worthy of clinical application [62].

64 slice spiral CT combined with myocardial enzyme examination has good effect and high accuracy in diagnosis of acute cardiogenic thoracodynia, meanwhile, it has positive significance in judging nature of coronary plaque and stenosis [63].

Compared with qualitative determination of serum cTnI, increase of serum myeloperoxidase (MPO) level can more accurately identify patients with true cardiogenic thoracodynia, it has unique sensitivity and specificity for identifying the increase of serum MPO in true cardiogenic thoracodynia [75]. Serum MPO examination is an important auxiliary means for identifying true cardiogenic thoracodynia in emergency room [75].

CONCLUSION

A study in United States found more than 8 million patients go to emergency department every year due to acute thoracodynia, of which only 10% are finally diagnosed as acute coronary syndrome (ACS) [14]. Before there is no definite basis for ACS, clinicians tend to diagnose ACS and observe and treat patients according to ACS; in another study of 10689 patients, 2.2% of patients with acute thoracodynia and eventually diagnosed with ACS were misdiagnosed [14]. Therefore, in order to avoid misdiagnosis, missed diagnosis and unnecessary medical waste, it is very important to find appropriate evaluation tools Heart score is an acute thoracodynia scoring tool widely used in emergency at present, with high specificity and sensitivity [14].

The treatment of patients with acute thoracodynia (especially acute coronary syndrome) is one of clinical difficulties how to quickly classify and treat patients with acute thoracodynia, and not only reduce the risk of patients, but also reduce the treatment cost of patients, clinical countermeasures have become more and more important [15].

Patients in " thoracodynia center" for acute thoracodynia are mainly cardiovascular thoracodynia diseases, of which the proportion of coronary heart disease is the highest, followed by respiratory diseases [8]. Spring is the season of high incidence of cardiovascular diseases, we should pay attention to keeping warm and improve the awareness of cardiovascular disease prevention [8]. The morning is the time of high incidence of cardiovascular diseases, pay attention to diagnosis and differential diagnosis to prevent missed diagnosis and misdiagnosis, early interventional therapy can improve the clinical prognosis and reduce mortality of patients with cardiovascular thoracodynia [8].

Patients with acute cardiogenic thoracodynia need to see a doctor in time once they develop, so as to effectively reduce mortality and improve prognosis of patients [57].

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REFERENCES

- [1] Chinese Medical Association, Journal of Chinese Medical Association, general medicine branch of Chinese Medical Association, Editorial Committee of Chinese Journal of general practitioners of Chinese Medical Association & Expert Group for the preparation of basic diagnosis and treatment guidelines for cardiovascular diseases 2019 (2019) (in Chinese). Guidelines for primary diagnosis and treatment of chest pain. *Chinese Journal of general practitioners*, 18, 913-919.
- [2] Chinese Medical Association, Journal of Chinese Medical Association, general medicine branch of Chinese Medical Association, Editorial Committee of Chinese Journal of general practitioners of Chinese Medical Association & Expert Group for the preparation of basic diagnosis and treatment guidelines for cardiovascular diseases 2019 (2019) (in Chinese). Guidelines for primary diagnosis and treatment of chest pain (Practical edition · 2019). *Chinese Journal of general practitioners*, 18, 920-924.
- [3] Zhang J H & Gai Z K. (2004). Diagnostic thinking and clinical practice of acute non - traumatic fatal chest pain (in Chinese). *Chinese general practice*, 7, 1834-1835.
- [4] Zhou Sh X & Yang Q. (2006). Etiological diagnosis of chest pain (in Chinese). *Chinese general practice*, 9, 124-126.
- [5] Zhao F, Hu W X & Song W G. (2003). Clinical analysis of 31 cases of chest pain caused by rib calcification General practice (in Chinese). *Clinical and education*, 1, 42-42.
- [6] Wen X Q, Zheng B & Tang Y L. (2016). Clinical characteristics and etiology of non - traumatic chest pain in emergency department of different genders (in Chinese). *Chinese general practice*, 19, 3607-3610.
- [7] (2006). Chest pain (in Chinese). *Chinese general practice*, 9, 1078-1079.
- [8] Shi Q. (2018). Analysis of clinical characteristics of patients with acute chest pain (in Chinese). *Master thesis*, Tianjin Medical University.
- [9] Yu Y Q. (2020). How to distinguish between chest pain and angina pectoris (in Chinese). *Everyone is healthy*, 32.
- [10] Ma P F. (2003). Analysis of 17 cases of esophageal chest pain misdiagnosed as cardiogenic chest pain (in Chinese). *Chinese general practice*, 6, 739-739.
- [11] Chen H B, Pan H H, Huang M D, Shen W F, Zou H X, Shao P Y, Zhai Ch L & Wu H J. (2020). The value of calcium sensitive receptor assay in the diagnosis of myocardial infarction within 4 hours of chest pain (in Chinese). *General practice, clinical and education*, 18, 604-606.
- [12] Ding F, Guo L, Liu X, Zhao X She, Si Q G W & Zhang J. (2020). Identification of patients with nonspecific chest pain before coronary angiography (in Chinese). *Chinese general practice*, 23, 289-293.
- [13] Liang J R, Liu W F, Nan F & Wang L. (2009). Comparison of mental health status between coronary heart disease patients with recurrent chest pain after percutaneous coronary intervention and coronary artery bypass grafting and normal population (in Chinese). *Chinese general practice* 12, 1945-1946/1949.
- [14] Li K J, Wu C C, Xiao L M, Xu J, Ji S Y, Yang K Ch & Ye L. (2021). Clinical application of myocardial injury markers and heart score in acute coronary syndrome (in Chinese). *Zhejiang Journal of integrated traditional Chinese and Western medicine*, 31, 726-729.
- [15] Rong Q F & Su En B. (2002). Risk stratification and Clinical Countermeasures of acute chest pain (in Chinese). *Chinese general practice*, 5, 999-1003.

- [16] Kong X Y, Yin M X, Sun J X. (2003). Clinical characteristics and misdiagnosis analysis of 29 cases of Rickettsia tsutsugamushi pneumonia (in Chinese). *Guangdong Medical Journal*, 24 (8): 845-846.
- [17] Yang J. (2006). Gastroesophageal reflux disease and non-cardiogenic chest pain (in Chinese). *Chinese general practice*, 9 (24): 2025-2026.
- [18] Qu Sh, Shi X X, Xie Zh J, et al. (2021). Validity and reliability of patient health questionnaire and generalized anxiety scale in screening depression and anxiety in patients with non-cardiogenic chest pain (in Chinese). *Chinese Journal of mental health*, 35 (5): 376-381.
- [19] Li M, Ying X, Chen L, et al. (2021). Study on esophageal body contraction pattern in 27 cases of non-cardiogenic chest pain (in Chinese). *Chinese Journal of digestion*, 41 (9): 588-592.
- [20] He X F, Ye X Y, Duan X L. (2021). Quantitative analysis of influencing factors of acute cardiogenic chest pain and construction of emergency triage model (in Chinese). *Qilu Journal of nursing*, 27 (13): 87-90.
- [21] Liu Sh, Yin R, Liao Zh H, et al. (2020). Application of hs CRP, TPI and heart scoring system in acute cardiogenic chest pain and its predictive value for major adverse cardiovascular events (in Chinese). *Chinese Journal of evidence based cardiovascular medicine*, 12 (4): 489-492.
- [22] Wang H Y, Tang Q F, Xie Y, et al. (2019). Quantitative analysis and triage judgment of influencing factors in patients with emergency cardiogenic chest pain (in Chinese). *Journal of nursing*, 34 (12): 31-34.
- [23] Liu L, Liu P. (2020). Application value of prehospital first aid and emergency bridging nursing in patients with cardiogenic chest pain (in Chinese). *Electronic Journal of clinical medical literature*, 7 (88): 110121.
- [24] Abulaikemu mahemuti, maimaimaiti ESGE, Yili, Alimu Maimaiti, etc. (2020). Investigation on the prevalence of esophagus in patients with non-cardiogenic chest pain related to gastroesophageal reflux disease (in Chinese). *Chinese Journal of gastroesophageal reflux disease*, 7 (2): 93-97.
- [25] Song Y Y, Ying J H. (2020). Quantitative analysis and triage judgment of influencing factors in patients with emergency cardiogenic chest pain (in Chinese). *Knowledge of cardiovascular disease prevention and treatment*, 10 (23): 40-42.
- [26] Wen Rui. (2020). Analysis of patients with cardiogenic chest pain, non-cardiogenic chest pain and high-risk chest pain in emergency department (in Chinese). *Dietary health care*, 7 (26): 14-15.
- [27] Zheng J, He H, Su L, et al. (2011). Epidemiological investigation of non-cardiogenic chest pain in community population in Guangzhou (in Chinese). *Journal of Sun Yat sen University (Medical Science Edition)*, 32 (3): 415-420.
- [28] Zhou R J, Shi Zh. (2010). Diagnosis and treatment of chronic non-cardiogenic chest pain (in Chinese). *Chongqing Medical Journal*, 39 (15): 2000-2001.
- [29] Liu X G, Chi Y N. (2007). cardiogenic chest pain (in Chinese). *Chinese Journal of practical internal medicine*, 27 (8): 571-573.
- [30] Wang T L, Peng K R, Jiang M Z, et al. (2006). Relationship between non-cardiogenic chest pain and gastroesophageal reflux in children (in Chinese). *Chinese Journal of tuberculosis and respiration*, 29 (8): 563-566.
- [31] Wang H J, Sha W H, Kuang H B, et al. (2017). Comparative analysis of anxiety and depression in patients with cardiogenic chest pain and non-cardiogenic chest pain (in Chinese). *Lingnan Journal of cardiovascular disease*, 23 (6): 792-794.

- [32] Tang Zh J, Li X Zh, Li J, et al. (2019). Study on pre hospital first aid and emergency connection nursing cooperation and management strategy for patients with cardiogenic chest pain (in Chinese). *Journal of electrocardiogram (Electronic Edition)*, 8 (4): 234-235.
- [33] Xu T, Jiang J W. (2019). Clinical observation of Jiangqi Sanyu Decoction in the treatment of non-cardiogenic chest pain after PCI for coronary heart disease (in Chinese). *Yunnan Journal of traditional Chinese medicine*, 40 (10): 47-49.
- [34] Qiu W. (2019). Predictive value of erythrocyte distribution width on short-term prognosis of patients with acute cardiogenic chest pain (in Chinese). *China prescription drugs*, 17 (2): 125-126.
- [35] Shi Y J, Chen S, Zhang F L, et al. (2019). Value of triple index identification of myocardial infarction in patients with cardiogenic chest pain undergoing emergency PCI (in Chinese). *Traffic medicine*, 33 (5): 472-474.
- [36] Li W J, Chen Q D. (2019). Value of myocardial enzyme detection combined with multi-slice spiral CT in the diagnosis of patients with acute cardiogenic chest pain (in Chinese). *Modern diagnosis and treatment*, 30 (9): 1501-1502.
- [37] Zhang X X, Zheng Y J, Liu J, et al. (2016). Guiding significance of characteristic changes of cardiogenic chest pain for rapid triage (in Chinese). *China cardiovascular research*, 14 (6): 537-539.
- [38] Yang H Y, Kong Y M, Yan J J, et al. (2016). Effect of cognitive behavioral therapy on anxiety and depression in patients with non-cardiogenic chest pain after PCI (in Chinese). *Journal of integrated traditional Chinese and Western Medicine on cardiovascular and cerebrovascular diseases*, 14 (7): 775-777.
- [39] Zeng G H, Lu P, Jin J. (2018). Clinical characteristics of cardiogenic and non-cardiogenic acute chest pain (in Chinese). *Modern instruments and medicine*, 24 (6): 133-135.
- [40] Wang H. (2018). Gu Erli Diagnostic strategy of non-cardiogenic chest pain (in Chinese). *Journal of Gastroenterology and Hepatology*, 27 (9): 1067-1070.
- [41] Huang W J, Huang L Y, Feng Y F. (2017). Value of heart score in differential diagnosis of emergency cardiogenic chest pain (in Chinese). *China practical medicine*, 12 (11): 89-90.
- [42] Sun D Y, Zheng P. (2017). Effect of chest pain center on diagnosis and treatment time of patients with acute cardiogenic chest pain (in Chinese). *China health nutrition*, 27 (30): 58-59.
- [43] Huang L Y, Huang W J, Feng Y F, et al. (2017). Nursing care of patients with acute cardiogenic chest pain undergoing stent implantation (in Chinese). *Jilin Medical Science*, 38 (5): 991-992.
- [44] Zhang K H. (2017). Value of color Doppler ultrasound and ECG in differentiating cardiogenic chest pain (in Chinese). *Dietary health care*, 4 (19): 324.
- [45] Song T X, Yu J Q, Guo G Y. (2017). Cause analysis of 176 cases of outpatient non-cardiogenic chest pain (in Chinese). *Psychologist*, 23 (1): 263-264.
- [46] Li Y J, Chen J Y, Yang Y Q, et al. (2014). Effect of cognitive behavioral intervention on patients with non-cardiogenic chest pain (in Chinese). *Nursing and rehabilitation*, 13 (9): 857-858.
- [47] Xu W H, Lin Zh, Lin L, et al. (2013). Investigation on clinical characteristics, psychological status and quality of life of patients with non-cardiogenic chest pain related to gastroesophageal reflux disease (in Chinese). *Western Traditional Chinese medicine*, 26 (5): 66-70.

- [48] Mo Q Q, Wu Zh Y, Zhou H. (2013). Correlation between psychological state and personality characteristics of patients with non-cardiogenic chest pain (in Chinese). *Qilu Journal of nursing*, (23): 70-72.
- [49] Xia Ch J, Pi Zh Y, Zhao W. (2013). Clinical analysis of 65 cases of non-cardiogenic chest pain (in Chinese). *Western medicine*, 25 (12): 1831-1832.
- [50] Yu Zh J, Chen H X, Luo Ch, et al. (2013). Application of acid inhibition test in acid related non-cardiogenic chest pain (in Chinese). *Journal of Gastroenterology and Hepatology*, 22 (11): 1108-1109.
- [51] Cao J G, Liu W Q, Liu T G. (2012). Rapid screening of acute cardiogenic chest pain (in Chinese). *Chinese clinician*, 40 (3): 53-54.
- [52] Liang Sh Y, Liu G J, Pan Y X. (2012). Value of color Doppler ultrasound and ECG in differentiating cardiogenic chest pain (in Chinese). *China cosmetic medicine*, 21 (14): 202.
- [53] Zheng H, Lu T B. (2016). Analysis of 28 cases of non-cardiogenic chest pain misdiagnosed as coronary heart disease (in Chinese). *Journal of Qiannan Medical College for nationalities*, 29 (3): 183-184.
- [54] Huang W J, Huang L Y, Feng Y F. (2016). Application effect of modified heart score in early diagnosis of cardiogenic chest pain (in Chinese). *China modern drug application*, 10 (13): 84-85.
- [55] Tu L, Chen J, Zhang J M, et al. (2010). Study on the influence of psychological factors on the quality of life of patients with non-cardiogenic chest pain (in Chinese). *Journal of Clinical Gastroenterology*, 22 (3): 162-165.
- [56] Wang G J, Du Zh J, Yang L. (2009). Application of multi-slice spiral CT in the diagnosis of non-cardiogenic chest pain (in Chinese). *Hebei medicine*, 31 (2): 173-174.
- [57] Yin W H, Hao J. (2018). Analysis of pre hospital first aid in 150 patients with acute cardiogenic chest pain (in Chinese). *Chinese Practical Medicine*, 13 (3): 156-158.
- [58] Zeng G M, Bai Y. (2018). Nursing cooperation and Management Countermeasures of pre hospital first aid and emergency for patients with cardiogenic chest pain (in Chinese). *Electronic Journal of clinical medical literature*, 5 (A3): 16,20.
- [59] Liu Z M, Hu Y Q, Hou X H. (2007). Relationship between psychological abnormalities and symptoms in patients with non-cardiogenic chest pain (in Chinese). *Journal of Gastroenterology and Hepatology*, 16 (4): 388-390.
- [60] Yi Z Q. (2000). Non cardiogenic chest pain (in Chinese). *Journal of clinical internal medicine*, 17 (2): 79-80.
- [61] Liu G R, Guo D F, Zhang Ch J, et al. (2015). Clinical diagnostic value of ischemia modified protein in cardiogenic chest pain (in Chinese). *Agricultural Reclamation medicine*, 37 (2): 103-106.
- [62] Wang Y L. (2015). Clinical value of TIMI risk score in screening patients with acute cardiogenic chest pain (in Chinese). *Sino foreign medical*, 34 (28): 82-84.
- [63] Yang L F. (2015). Clinical value of 64 slice spiral CT combined with myocardial enzyme examination in the diagnosis of acute cardiogenic chest pain (in Chinese). *China continuing medical education*, (1): 145-146.
- [64] Guo Zh L. (2015). Clinical analysis of 40 cases of non-cardiogenic chest pain (in Chinese). *Grassroots medical forum*, (26): 3652-3653.

- [65] Chen Sh F, Luo Y. (2021). Effect of emergency high-risk chest pain risk assessment form on patients with cardiogenic chest pain (in Chinese). *Abstract of the world's latest medical information*, 21 (40): 67-68.
- [66] Deng Zh Ch, Zhu L B, Wang H P, et al. (2014). Value of modified heart score in early diagnosis of cardiogenic chest pain (in Chinese). *Lingnan Journal of emergency medicine*, 19 (1): 3-6.
- [67] Liang Sh Y, Liu G J. (2014). Research Progress on self-management of pre hospital first aid for patients with cardiogenic chest pain (in Chinese). *Chinese medical guidelines*, (35): 63-64.
- [68] Liu G J, Liang Sh Y. (2014). Investigation and analysis of self-health of patients with emergency cardiogenic chest pain (in Chinese). *Medical information*, (32): 23-24.
- [69] Liang Sh Y, Liu G J, Pan Y X. (2012). Research progress of echocardiography in cardiogenic chest pain (in Chinese). *Journal of clinical rational drug use*, 5 (18): 168-169.
- [70] Liang Z, Chen Ch N, Zhang Ch, et al. (2011). Differentiation and risk stratification of cardiogenic chest pain in patients with malignant tumor chest pain (clinical analysis of 52 cases) (in Chinese). *Jilin Medical Journal*, 32 (20): 4175-4176.
- [71] Liu H Q, Cao G H, Ouyang H H. (2011). Significance of serum ischemia modified albumin in the diagnosis of cardiogenic diseases in young patients with acute chest pain (in Chinese). *Journal of Mathematical Medicine*, 24 (3): 302-303.
- [72] Fei Y M, Zhu Y Sh, Han Y Sh, et al. (2010). Clinical analysis of 80 cases of non-cardiogenic chest pain [J] *Journal of Anhui health vocational and technical college*, 9 (5): 21-22.
- [73] Li Y F, Zhang X L, Xu Ch J, et al. (2010). Clinical symptoms, mental health status and quality of life of patients with non-cardiogenic chest pain (in Chinese). *Chinese Journal of clinical practical medicine*, 04 (7): 250-252.
- [74] Li Zh Zh. (2010). Analysis of cases misdiagnosed as cardiogenic chest pain (in Chinese). *Chinese contemporary medicine*, 17 (32): 132-132.
- [75] Xu F X, Zhang X J, Hu Ch L. (2009). Value of emergency serum myeloperoxidase examination in differentiating cardiogenic chest pain (in Chinese). *Journal of Gannan Medical College*, 29 (4): 525-526.
- [76] Yuan A M, Liang X L, Zhu M J. (2008). Clinical study on non-cardiogenic chest pain and acid reflux in the elderly (in Chinese). *Chinese medical guidelines*, 6 (15): 50-51,16.
- [77] Li M, Sun L. (2007). Cause analysis of 176 cases of outpatient non-cardiogenic chest pain (in Chinese). *Southwest military doctor*, 9 (4): 52-53.
- [78] Shu W X, Xi Y R. (2007). Experience of diagnosis and treatment of non-cardiogenic chest pain in grass-roots hospitals (in Chinese). *Health vocational education*, 25 (19): 146-147.
- [79] Su Zh Y, Wei Shi X. (2004). Clinical observation of 73 cases of non-cardiogenic chest pain with left ventricular high voltage (in Chinese). *Lingnan Journal of emergency medicine*, 9 (1): 51-52.
- [80] Gao X, Wang Y X. (2002). Causes and diagnosis of 39 cases of non-cardiogenic angina pectoris like chest pain (in Chinese). *Huaxia medicine*, 15 (3): 356-358.
- [81] Wang Y, Shi L P. (2010). Observation on 50 cases of non-cardiogenic chest pain treated with huoxiong Liqi Decoction (in Chinese). *Chinese and foreign health abstracts*, 7 (29): 227-228.

- [82] Jing H Y, Yuan X L, Lu Y H. (2007). Diagnosis of cardiac troponin T in cardiogenic chest pain (in Chinese). *Journal of medical forum*, 28 (7): 76.
- [83] Huang X D, Lai H H, Lin Q. (2012). Value of 64 slice spiral CT and its combined myocardial enzyme examination in the diagnosis of acute cardiogenic chest pain (in Chinese). *Journal of medical imaging*, 22 (7): 1100-1102.
- [84] Muzapar Musha. (2018). Application of combined diagnostic method in non-cardiogenic chest pain associated with gastroesophageal reflux disease (in Chinese). *Xinjiang: Xinjiang Medical University*.
- [85] Liu Ch F, Zhu Sh L. (2012). Research progress of non-cardiogenic chest pain associated with gastroesophageal reflux disease (in Chinese). *Guangming traditional Chinese medicine*, 27 (8): 1711-1713.
- [86] Zhao X Sh, Fu X C. (2002). Causes and diagnosis of non-cardiogenic angina pectoris like chest pain (analysis of 39 cases) (in Chinese). *Journal of Linyi Medical College*, 24 (4): 249-250.
- [87] Liu G R. (2015). Study on the difference of ischemia modified protein in patients with cardiogenic and non-cardiogenic chest pain (in Chinese). *Ningxia: Ningxia Medical University*.
- [88] Li Y M. (2014). Value of different risk scores in evaluating the prognosis of emergency patients with suspected cardiogenic chest pain (in Chinese). *Guangzhou Medical University*.
- [89] Zhang J M. (2011). Study on the relationship between psychological factors and quality of life in patients with non-cardiogenic chest pain (in Chinese). *Hubei: Huazhong University of science and technology*.
- [90] Gao Y, Huang Zh L. (2013). Necessity of endoscopy for non-cardiogenic chest pain (in Chinese). *Proceedings of the eighth annual conference of natural science of Inner Mongolia Autonomous Region*: 590-592.
- [91] Chen Y Y. (2009). Clinical identification and treatment of anxiety and depression in patients with non-cardiogenic chest pain (in Chinese). *Shanghai: Shanghai Jiaotong University*.
- [92] Zheng J. (2008). Study on the diagnosis of non-cardiogenic chest pain related to gastroesophageal reflux disease (in Chinese). *Guangdong: Sun Yat sen University*.
- [93] Ye R F. (2006). Psychosocial factors and intervention of non-cardiogenic chest pain (in Chinese). *The 8th South China International Conference on cardiovascular diseases*: 188-190.
- [94] Wang Z J, Wang X, Xiao K. (2019). Significance of coronary artery calcification score in predicting cardiovascular events in patients with suspected cardiogenic chronic chest pain (in Chinese). *Journal of Hebei Medical University*, 40 (4): 456-460.
- [95] Liu T T, Chen X L, Tang L J, et al. (2011). Application of Coherent Contrast Imaging in risk stratification of suspected cardiogenic chest pain (in Chinese). *Chinese Journal of ultrasound medicine*, 27 (9): 803-806.
- [96] Li Y D, Sun Q, Hu G Y, et al. (2009). Correlation between creatine kinase isozyme and cardiac fatty acid binding protein in patients with cardiogenic chest pain (in Chinese). *Chinese general practice*, 12 (19): 1756-1758/1761.
- [97] Zheng J, Du Zh M, Chen M H, et al. (2008). Diagnosis of non-cardiogenic chest pain associated with gastroesophageal reflux disease (in Chinese). *Chinese Journal of medicine*, 88 (20): 1390-1393.
- [98] Liu Z M, Xu Zh, Hu Y Q, et al. (2007). Relationship between non-cardiogenic chest pain and acid reflux (in Chinese). *Chinese Journal of digestion*, 27 (4): 217-220.

- [99] Zhang Y. (2005). 25 cases of non-cardiogenic chest pain misdiagnosed as angina pectoris (in Chinese). *Journal of the Fourth Military Medical University*, 26 (13): 1179.
- [100] Liao Zh Ch, Chen M T, Luo X Y. (2002). Dynamic examination and treatment of gastroesophageal reflux in 29 cases of non-cardiogenic chest pain (in Chinese). *Journal of practical medicine*, 18 (3): 280-281.
- [101] Jiang B Y, Wang G Sh, Li T T, et al. (2017). Application of global registration study score of acute coronary events and modified early warning system score in patients with acute cardiogenic chest pain (in Chinese). *Chinese Journal of clinical health care*, 20 (5): 505-508.
- [102] Huang Y Zh. (2021). Application of high sensitivity-C-reactive protein, troponin I combined with heart scoring system in acute cardiogenic chest pain and analysis of the total incidence of mace (in Chinese). *Chinese and foreign medical research*, 19 (17): 78-80.
- [103] Guo L D. (2018). Wang Jian Role of bedside immediate echocardiography in acute cardiogenic chest pain (in Chinese). *Chinese Journal of clinicians (Electronic Edition)*, 12 (10): 559-562.
- [104] Abulaikemu mahemuti, maimaimaiti esre, Yili, Zhao X Sh, et al. (2019). Effects of esophageal mixed acid reflux and hypodynamia on the onset of non-cardiogenic chest pain (in Chinese). *Chinese Journal of gastroesophageal reflux disease*, (3): 121-125.
- [105] Zhang Y, Li M, Liu W J. (2011). Application value of MSCT in the diagnosis of acute non-cardiogenic chest pain (in Chinese). *Chinese Journal of integrated traditional Chinese and Western medicine imaging*, 9 (2): 144-146.
- [106] Li Z B, Liu N, Li J. (2012). Clinical value of TIMI risk score in screening patients with acute cardiogenic chest pain (in Chinese). *Chinese medical guidelines*, 10 (21): 186-187.
- [107] Liu G R, Guo D F, Zhang Ch J, et al. (2016). Clinical diagnostic value of ischemia modified protein in cardiogenic chest pain [J] *Agricultural Reclamation medicine*, 37 (2): 103-106.
- [108] Zhu L B, Deng Zh Ch, Wang H P, et al. (2014). Value of combined detection of ischemia modified albumin and cardiac fatty acid binding protein in early diagnosis of emergency cardiogenic chest pain (in Chinese). *International medical and health Herald*, 20 (10): 1383-1385.
- [109] Chen C Y. (2008). Three cases of non-cardiogenic chest pain misdiagnosed as coronary heart disease (in Chinese). *Clinical meta-analysis*, 23 (14): 1008-1008.
- [110] Zhang H G. (2009). Differential diagnosis of non-cardiogenic chest pain (in Chinese). *Inner Mongolia Journal of medicine*, (S4): 56-57.
- [111] Tang M Q. (2008). Misdiagnosis analysis of 48 cases of non-cardiogenic chest pain (in Chinese). *Chinese Journal of health and nutrition (Journal of clinical medicine)*, 2008017 (3): 171-172.
- [112] Yang J X. (2008). Help you analyze cardiogenic chest pain (in Chinese). *Seeking medical advice*, 2008, (5): 14-15.
- [113] Liu X G, Chi Y. (2007). Digestive system diseases and systemic diseases - non cardiogenic chest pain (in Chinese). *Chinese Journal of practical internal medicine*, (8).
- [114] Hobson, A., R., et al. (2006). Neurophysiological evaluation of esophageal sensory process in patients with non-cardiogenic chest pain (in Chinese). *Abstracts of World Core Medical Journals (Gastroenterology)*, (6).

- [115] Birnie D. H., Vickers L. e., Hillis W. S., et al. (2006). The increased titer of anti-human heat shock protein 60 suggests a poor one-year prognosis in patients with acute cardiogenic chest pain (in Chinese). *Abstracts of World Core Medical Journals (Cardiology)*, (1): 49-50.
- [116] Yang N, Chi Zh Ch. (2005). Advances in diagnosis and treatment of functional diseases of digestive tract - esophageal reflux disease and non-cardiogenic chest pain (in Chinese). *Journal of physician training*, 2005028 (3): 1-3.
- [117] DEBORAH B. Dierks, elizabeth boghos, hectorguzman, et al. (2005). The quantitative score of sublingual nitroglycerin on pain change cannot predict cardiogenic chest pain. *World Journal of acute and critical illness medicine*, 2005002 (4): 830-833.
- [118] Wu Sh L. (1998). Diagnostic experience of cardiogenic chest pain (in Chinese). *Chinese Journal of practical internal medicine*, 1998, (8): 12-13.
- [119] Wei K M. (1997). Beware of non-cardiogenic chest pain (in Chinese). *Medicine and health care*, (7).
- [120] Zhou H Y. (1997). Relationship between gastroesophageal reflux and non-cardiogenic chest pain (in Chinese). *Clinical medicine*, (9): 17-18.
- [121] Chen Y Sh, Bai J N, Zhu W Q, et al. (1996). Clinical analysis of 54 cases of non-coronary heart disease cardiogenic chest pain (in Chinese). *Medical review*, (5): 235-236.
- [122] Liu Y Y, He B R, Yan H Ch. (1989). Fever, palpitation, chest pain, cardiogenic shock (in Chinese). *Journal of physician training*, (2): 37-39.
- [123] Wang K, Duan L P. (2006). Research progress of esophageal non-cardiac chest pain (in Chinese). *Chinese Journal of pain medicine*, 12 (5): 265-267.
- [124] Ma P F. (2003). Analysis of 17 cases of esophageal chest pain misdiagnosed as cardiogenic chest pain (in Chinese). *Chinese general practice*, 6 (9): 739-739.
- [125] Tang H Q. (2002). Cause analysis of 68 cases of non-cardiogenic chest pain (in Chinese). *Journal of practical medicine*, 18 (3): 287-287.
- [126] Han Y. (2017). Current situation and progress in the treatment of non-cardiogenic chest pain (in Chinese). *Clinical meta-analysis*, 32 (1): 50-53.
- [127] Jiang H. (2012). Application of ischemia modified albumin in early diagnosis of cardiogenic chest pain (in Chinese). *Chinese Journal of misdiagnosis*, 12 (15): 3879.
- [128] Huang L M, Zhao B Ch, Li J R. (2010). Clinical significance of plasma hs CRP level in predicting the occurrence of cardiogenic diseases in patients with emergency chest pain (in Chinese). *Chinese Journal of experimental diagnostics*, 14 (8): 1281-1282.
- [129] Wang J G, Wan Sh B. (2008). Application of cardiac troponin T qualitative test in differential diagnosis of acute cardiogenic chest pain (in Chinese). *Journal of microcirculation*, 18 (2): 69,72.
- [130] Zheng J, Hu P J. (2007). Research progress of non-cardiogenic chest pain (in Chinese). *Modern digestion and interventional diagnosis and treatment*, 12 (2): 133-136.
- [131] Yu X Q, Liu J T, Ye P. (2006). Diagnostic value of 24 h esophageal pH measurement and omeprazole test in gastroesophageal reflux disease in non-cardiogenic chest pain (in Chinese). *Chinese Journal of misdiagnosis*, 6 (18): 3541-3542.

- [132] Yang N. (2005). Chi Zhaochun Esophageal reflux disease and non-cardiogenic chest pain (in Chinese). *Journal of physician training*, 28 (5): 1-3.
- [133] Chen H J, Wei Zh B. (2005). Clinical analysis of 60 cases of non-cardiogenic chest pain (in Chinese). *Practical general practice*, 3 (5): 454.
- [134] Li J, Wang Zh Zh, Liu Q. (2004). Observation on clinical characteristics of cardiogenic and esophagogenic chest pain (in Chinese). *Guizhou medicine*, 28 (7): 609-610.
- [135] Wang H L, Li L. (2003). Nursing care of stent implantation for acute cardiogenic chest pain (in Chinese). *Qilu Journal of nursing*, 9 (12): 918-919.
- [136] Liu L P, Leng B, MD. (2001). 008 significance of platelet selectin (soluble and platelet binding) in differentiating acute cardiogenic and non-cardiogenic chest pain (in Chinese). *Advances in cardiology*, 22 (1): 63.
- [137] Yang X F. (2009). Cause analysis of 176 cases of outpatient non-cardiogenic chest pain (in Chinese). *Modern health B*, (9): 81-82.
- [138] Huo J R. (2004). Gastroesophageal reflux disease and non-cardiogenic chest pain (in Chinese). *Journal of medical news*, 14 (4): 228-230.
- [139] Lv H, Li B, Zou L, et al. (1998). Esophageal manometry and pH analysis in 31 patients with non-cardiogenic chest pain (in Chinese). *Armed police medicine*, 09 (5): 290-291.
- [140] Han Sh J, Wang J G. (1998). Application of cardiac troponin T qualitative test in differential diagnosis of cardiogenic chest pain (in Chinese). *Emergency medicine*, 7 (4): 265-266.
- [141] Chest tightness, chest pain and palpitation should be careful of sudden cardiac death (in Chinese). *Health guidelines*, (9): 66-67.
- [142] Zhou J Y. (1996). Report of 13 cases of non-cardiogenic chest pain in the elderly (in Chinese). *Journal of modern Gastroenterology and endoscopy*, 1 (2): 104.
- [143] Fan Y R. (2021). Analysis of risk factors of non-cardiogenic chest pain after endoscopic submucosal dissection (in Chinese). *Henan: Zhengzhou University*
- [144] Zhao J L. (1994). Analysis of 6 cases of non-cardiogenic chest pain misdiagnosed as coronary heart disease and angina pectoris (in Chinese). *Henan Medical information*, (5): 19.
- [145] Wu G X, Du F J. (2006). Differentiation of chest pain between possible ischemic heart disease and non-cardiac diseases (in Chinese). *Grassroots medical forum*, 10 (21): 1045-1046.
- [146] Cui Q J. (2003). Application of troponin T measured by colloidal gold immunochromatography in differential diagnosis of cardiogenic chest pain (in Chinese). *Journal of practical medical technology*, 10 (4): 328-329.
- [147] Zhou X J, Ma L K, Wei Y, et al. (2021). Construction of risk nomogram prediction model of nosocomial cardiogenic shock in patients with acute myocardial infarction (in Chinese). *Journal of clinical cardiovascular disease*, 37 (5): 421-427
- [148] Fang Y P. (2000). Misdiagnosis analysis of non-cardiogenic chest pain (in Chinese). *Zhejiang Journal of integrated traditional Chinese and Western medicine*, 10 (1): 48.

- [149] Miao F, Yu F Q, Zhang H Y, et al. (2003). Diagnosis and treatment of non-cardiogenic chest pain in hospitalized elderly patients (clinical analysis of 27 cases) (in Chinese). *Chinese Practical Medicine*, 5 (20): 110-111.
- [150] Yang Y L, Li X M. (2002). Analysis of esophageal acid and manometry in 86 patients with non-cardiogenic chest pain (in Chinese). *Chinese Journal of clinical medicine*, 2 (2): 58-59.
- [151] Li Ch D (2012). Clinical diagnosis and treatment of 43 cases of atypical non-cardiogenic chest pain (in Chinese). *Frontier of medicine*, (36): 169.
- [152] Liu G R, Guo D F. (2015). Clinical diagnostic value of ischemia modified protein in cardiogenic chest pain (in Chinese). *Proceedings of the 18th National Emergency Medicine Academic Annual Meeting of emergency medicine branch of Chinese Medical Association*: 34-34.
- [153] Zhang Y J. (2015). Relationship between cardiogenic chest pain and non-cardiogenic chest pain with left ventricular high voltage in elderly physical examination (in Chinese). *Proceedings of the 9th China Health Service Industry Conference and the 7th National Conference on health management of Chinese Medical Association*:1-4.
- [154] Du J B, Li J J, Xu Y, et al. (2013). Effect of continuous Shengmai Injection on acute coronary syndrome complicated with cardiogenic shock (in Chinese). *Chinese Journal of integrated traditional and Western medicine*, (5): 283-285.
- [155] Jiao P Q, Cai X Q, Liu Y, et al. (2020). A case of cardiogenic shock caused by covid-19 combined with acute myocardial infarction (in Chinese), *Southwest national defense medicine*, 30 (5): 402-403.
- [156] Huang W L, Li Zh X, Yang L, et al. (2007) Epidemiological and clinical characteristics of unexplained sudden cardiac death in Yunnan Province from 2002 to 2004 (in Chinese). *Chinese Journal of epidemiology*, 28 (3): 233-236.