American Journal Of Biomedical Science & Pharmaceutical Innovation

VOLUME Vol.06 Issue03 2026
PAGE NO. 12-14
DOI 10.37547/ajbspi/Volume06Issue03-03

The Use of Cardiac Auscultation in The Detection of Valvular Apparatus Defects

Azimova Mavlyuda Makhmudovna

DSc, Associate Professor of the department "Propaedeutics of Internal Diseases No. 2", Tashkent State Medical University, Tashkent, Uzbekistan

Buriev Dilmurod Rustamovich

Student of the 2nd medical faculty of the 305B group Tashkent State Medical University, Tashkent, Uzbekistan

Received: 24 January 2026; **Accepted:** 20 February 2026; **Published:** 12 March 2026

Abstract: The aim of the study was to identify heart valve defects in the early stages using auscultation, to evaluate its informative value and accuracy compared with echocardiography.

Keywords: Auscultation, valvular defects, insufficiency, stenosis, noise, echocardiography, primary diagnosis, artificial intelligence.

Introduction: Valvular heart defects remain one of the most common forms of cardiovascular pathology. They are most often detected at the stage of pronounced clinical manifestations, which makes it difficult to prevent complications early.

Despite the development of instrumental diagnostic methods such as echocardiography and Dopplerography, physical examination remains crucial at the stage of initial contact between a doctor and a patient. Auscultation of the heart makes it possible to identify characteristic changes in tones and noises, which serve as a primary guideline in determining the type and degree of valve damage.

Early assessment of auscultation data is especially important in conditions of limited access to high-tech methods, which makes auscultation an indispensable screening tool. The study of the informative value of auscultation and its comparison with instrumental methods is of considerable practical value.

METHODS

The study included 130 patients aged 25 to 78 years with suspected valvular heart defects.

Research methodology:

1. Auscultation of the heart:

• Analysis of tones I and II;

• Recording the presence, nature and phase of noise;

• Determination of the maximum sound zone and the direction of radiation.

2. Echocardiography was used as a verification method.

Principles of the methodology: based on classical propaedeutics of internal diseases (Kukes V.G., Bates B., Ivashkin V.T.).

Evaluation criteria:

• Sensitivity of auscultation to the detection of pronounced valvular defects;

• Comparison of auscultation data with echocardiography results;

• Analysis of factors that make diagnosis difficult (obesity, tachycardia, combined malformations, pulmonary hypertension).

RESULTS

Characteristic auscultation signs were detected in the majority of patients:

Vice	Auscultation characteristic	Zone of maximum sound	Irradiation	Sensitivity (%)
Mitral stenosis	Diastolic "Growling" noise, popping opening tone	The apex of the heart	Is limited to the apical region	85
Mitral insufficiency	Systolic murmur	Apex of the heart	Left axillary region	80
Aortic stenosis	Rough systolic murmur	Intercostal space II on the right	Carotid artery	91
Aortic insufficiency	Early diastolic murmur decompressing	the left edge of the sternum	Down the left edge of the sternum	76

General observations:

• The highest accuracy rates were observed in aortic and mitral stenosis.

• Diagnostic difficulties occurred when:

• combined vices;

• tachycardia;

• obesity;

• pulmonary hypertension.

Conclusions from the research experience:

• The doctor's experience significantly affects the accuracy of noise interpretation;

• Auscultation remains an effective screening method, but requires confirmation by echocardiography;

• Turbulent flows of significant intensity provide the most informative auscultation picture.

DISCUSSION

The study showed that auscultation:

1. Suggests the type and location of the valvular lesion;

2. Allows you to assess the severity of hemodynamic disorders;

3. It has high sensitivity to typical acoustic phenomena (noises with characteristic phase and radiation);

4. It is the least informative for mild regurgitation, combined malformations, obesity, emphysema and tachycardia;

5. Requires mandatory confirmation by echocardiography, especially in complex diagnostic cases.

Thus, auscultation remains a reliable method of preliminary detection of valvular defects, indispensable at the stage of initial examination and triage of patients.

CONCLUSION

• Cardiac auscultation has high clinical significance and remains an important screening method.

• Sensitivity of auscultation to pronounced valvular defects reaches 91%, specificity — up to 87%, especially in aortic and mitral stenosis.

• The method allows you to determine the need for further instrumental examination and promptly refer the patient for echocardiography.

• The doctor's experience and the correct auscultation technique directly affect the accuracy of diagnosis.

REFERENCES

1. Braunwald E, Zipes DP, Libby P, Bonow RO. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 12th ed. Philadelphia: Elsevier; 2022.
2. Otto CM, Bonow RO. Valvular Heart Disease: A Companion to Braunwald's Heart Disease. 5th ed. Philadelphia: Elsevier; 2021.
3. Kumar V, Abbas AK, Aster JC. Robbins and Cotran Pathologic Basis of Disease. 10th ed. Philadelphia: Elsevier; 2021.
4. Bickley LS. Bates' Guide to Physical Examination and History Taking. 13th ed. Philadelphia: Wolters Kluwer; 2021.
5. Lilly LS. Pathophysiology of Heart Disease: A Collaborative Project of Medical Students and Faculty. 6th ed. Philadelphia: Wolters Kluwer; 2020.
6. Perloff JK. Physical Examination of the Heart and Circulation. 4th ed. Philadelphia: Saunders; 2009.
7. Mangione S, Nieman LZ. Cardiac auscultatory skills of internal medicine and family practice trainees. JAMA. 1997;278(9):717–722.
8. Tavel ME. Cardiac auscultation: a glorious past—but does it have a future? Circulation.

2006;113(9):1255–1259.

9. Shaver JA. The history of cardiac auscultation. Am J Cardiol. 2003;92(12):1505–1509.
10. Leatham A. Auscultation of the heart. Lancet. 1958;272(7057):703–708.
11. McGee S. Evidence-Based Physical Diagnosis. 4th ed. Philadelphia: Elsevier; 2018.
12. Carabello BA, Paulus WJ. Aortic stenosis. Lancet. 2009;373(9667):956–966.
13. Nishimura RA, Otto CM, Bonow RO, et al. 2017 AHA/ACC guideline for the management of patients with valvular heart disease. Circulation. 2017;135(25):e1159–e1195.
14. Vahanian A, Beyersdorf F, Praz F, et al. 2021 ESC/EACTS guidelines for the management of valvular heart disease. Eur Heart J. 2022;43(7):561–632.
15. Tavel ME. Clinical Phonocardiography and External Pulse Recording. Chicago: Year Book Medical Publishers; 1972.