MITRAL VALVE REGURGITATION IN DEGENERATIVE CARDIAC DISEASE.

Cheng Shaoyong, Farra Aidah Jumuddin

[1]Lincoln University College, Petaling Jaya, Malaysia.

ABSTRACT

Diseases Trained by Cell Death Valvular abnormalities account for most occurrences of Mitral Regurgitation (MR), a disorder of the heart valves wherein blood flows backwards from the left ventricle to the left atrium. MR is becoming less frequent. Examining the complex function of "magnetic resonance imaging (MRI)" in CAD will help us to better grasp the condition, investigate alternative treatment strategies, and raise diagnosis capacity. The first chapter addresses degenerative valvular heart disease, therefore establishing the relevance of magnetic resonance (MR) and its increasing clinical use. Reviewing the relevant literature helps one to better grasp the limits of the research and identify the most urgent knowledge gaps. The combination of genetic research, clinical assessments, and innovative imaging techniques in this work offers fresh understanding of the causes of MR. This study clarifies the complex interaction of valve degradation, haemodynamic alterations, and cardiac remodelling during MR development. Pointy accuracy and precision in diagnosis define magnetic resonance imaging (MR) studies. This study contrasts and evaluates many diagnostic techniques to identify the ones most suited for practical environments. The researcher also discusses various recently developed diagnostic instruments that could revolutionise early identification and monitoring. Some of the potential therapies for mitral regurgitation brought on by "degenerative valvular cardiovascular disease" are discussed on this page. This book offers researchers and practitioners a complete tool for making informed treatment choices by means of analysis of medical care, surgical procedures, and new drugs. Apart from improving the knowledge of MRI in degenerative CAD, this thesis provides legislators, clinicians, and researchers with important data.

Keywords: Mitral Regurgitation, Valvular Cardiovascular Disease, Magnetic Resonance Imaging, Cell Death Valvular.

INTRODUCTION

Circulation of blood is controlled by the human heart via its complex rhythm of periodic contractions and relaxations. The heart's valve system is fundamental to this intricate system. Its main function is to restrict blood flow to the heart chambers to a certain direction. The mitral valve, which connects the left ventricle to the anterior part of the pulmonary atrium, is crucial for the proper functioning of the heart. Heart valves, on the other hand, are mechanical components and hence

subject to wear and strain over time. MR is a medical condition that may cause severe heart problems if the mitral valve is damaged. MR, also known as mitral insufficiency, is characterised by an abnormal retrograde blood flow from the anterior ventricle into the left atrium (Baumgartner, et.al. 2021). This occurs as a result of the ventricles contracting. Regurgitation is only one example of how an imbalance in the heart's regular functioning may throw off blood flow, structure, and clinical outcomes. The mitral valve leaflets, ciliary muscle tissue, chordae tendineae, and other cardiac structures are slowly impacted by myocardial regenerative disease (MRD). Degenerative heart valve disease is the most common cause (Van Wijngaarden et al., 2020). Important findings and links to diagnostic and therapeutic criteria are uncovered in this investigation of mitral regurgitation (MR) in the context of coronary heart disease. Here are the main points of the paragraph, analysed and summarised: Among 127 patients with a history of coronary heart disease, MR occurred in 31% of cases. The MR was significantly higher in patients who had a myocardial infarction (MI) in the past or whose electrocardiogram (ECG) revealed MI. (1) Indicators & Warnings Right Away: Murmurs at the apex and left sternal edge, mid-systolic, late-systolic, and pan-systolic may all be generated by MRI. More than 40% of patients had no murmur on MR scans that had been confirmed by angiography. There was no way for MR to remain silent or even utter a murmur. An increased systolic murmur, an indicator of angiographically significant MR (grades 2-4/4), is highly associated with this observation. Levels of metal bruit were associated with MRI. Both the patient's symptoms and the results of the chest x-rays indicated that MR was associated with left ventricular hypertrophy (Iung & Baron, 2022) found that electrocardiograms and chest x-rays more accurately showed left atrial enlargement as an indication of myocardial infarction. Increased BP in the pulmonary veins was a key indicator of MR (2) Coronary Artery Disease vs. Heart Attack: The frequency of myocardial revascularisation did not vary statistically according to the distribution of coronary artery disease or the location of the anterior or inferior myocardial infarction. The incidence of myocardial infarction was, however, substantially raised by severe coronary artery disease. An association between cardiac pumping capacity and MR incidence was shown to be associated with lower left ventricular ejection percentages and an increase in MR incidence. Myocardial infarction risk was shown to be higher in those with elevated left ventricular end-diastolic pressure. Uneven heartbeats were among the risk factors for myocardial infarction. the third section Interestingly, the severity of MR was unaffected by any of these traits. Mitral regurgitation is most often caused by coronary heart disease. (Viani et al., 2020) found that out of 127 patients, 39 (or

31% of the total) had left ventricular and coronary procedures due to their severe symptoms.

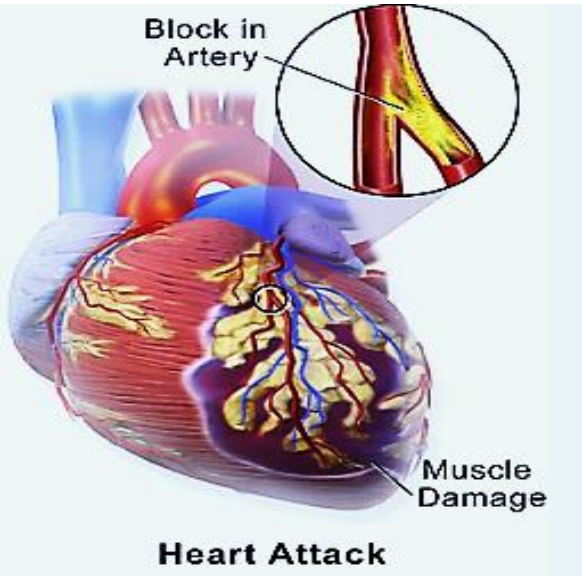

Figure 1: Myocardial infarction.

BACKGROUND OF THE STUDY

Background information is useful for two purposes: first, it sets the setting for the research; and second, it sheds insight on the bigger concerns, trends, or bodies of knowledge that motivate and justify looking at the "Mitral Valve" in the context of degenerative "Valve Coronary Artery Disease." The researcher has already discussed how valvular heart disease leads to degeneration and how it relates to mitral regurgitation (MR). The underlying cause of mitral regurgitation (MR) is an uneven closure within the mitral valve, which is in charge of keeping blood from seeping back into the chamber of the heart from the opposite side of the ventricle. The simplest explanation for mitral regurgitation is this. The result is an enlarged left ventricle, which redirects part of the blood supply to the left atrium but decreases the overall amount of blood that may reach the body. There are several conditions that may produce MR, including infections, cardiac issues, rheumatic fever, and congenital anomalies. Myxomatous disease of the mitral valve, valvular heart disease, and mitral valve prolapse are the common causes of mitral regurgitation (Nishimura & Tajik, 2020). A thickening, weakening, or bulging of the mitral valve occurs as a consequence of degenerative processes in this illness. The chords or the individual leaflets that make up the valve are responsible for such changes. These modifications have split the leaflets and rendered the valve partially inoperable. Degenerative valvular heart disease affects a tiny fraction of the population, around 10%, in their 75s and later years. As a percentage, it's quite high among the elderly.

Electrocardiogram findings indicating myocardial infarction or a history of cardiac issues increased the likelihood of mitral regurgitation. Possible clinical indications of mitral regurgitation include a pan-or late-systolic ejection-type murmur around

the apex or on the left side of the sternum. Notably, a murmur was absent in 39% of patients whose illness was verified by angiography. Children with angiographically severe mitral regurgitation were more likely to have systolic murmurs regardless of the ejection fraction. Radiographic or clinical evidence of left ventricular enlargement, pulmonary vein hypertension, and electrocardiographic or chest x-ray evidence of an enlarged left atrium are all symptoms that may be seen in patients with mitral regurgitation. Despite angiography ruling out mitral regurgitation as the cause of the illness, ECG findings of papillary muscle infarction were nevertheless uncommon (15% of cases). There was no statistically significant correlation between the location of the coronary arteries or the anterior distal myocardial infarction and the incidence of mitral regurgitation. The likelihood of mitral regurgitation is greater in patients with highly developed coronary arteries (P005). Abnormal contraction patterns, a smaller left ventricular ejection fraction (P 0001), a bigger left end-diastolic pressure (P 002), or both increase the likelihood of mitral regurgitation, however these characteristics do not correlate with the severity of the condition. (Enriquez-Sarano et al., 2023) states that accurate information about disease prevalence is lacking. Half a million Americans could be living with really severe ventricular regurgitation, according to extrapolation from natural history data. There was an increasing tendency in the spread rate for quite some time. As shown in Figure 1, there has been a noticeable rise in the number of patients diagnosed with AR and MR after leaving hospitals in the last 20 years, according to data from the state-wide administrative and research cooperation system (SPARCS). People who had previous heart issues or who had electrocardiographic signs of a recent myocardial infarction were far more likely to get mitral regurgitation. As a clinical indicator of mitral regurgitation, an ejection-type murmur around the left sternal border during the apex or late systolic phase is present. Notably, a murmur was not detected in 39% of individuals with angiographic symptoms of the illness. Children with angiographically severe mitral regurgitation were more likely to have systolic murmurs regardless of the ejection fraction. Radiographic or clinical evidence of left ventricular enlargement, pulmonary vein hypertension, and electrocardiographic or chest x-ray evidence of an enlarged left atrium are all symptoms that may be seen in patients with mitral regurgitation. Despite angiography ruling out mitral regurgitation as the cause of the illness, ECG findings of papillary muscle infarction were nevertheless uncommon (15% of cases). According to (Meyer et al., 2020), there was no significant association between the prevalence of mitral regurgitation and either the location of the coronary arteries or the anterior distal myocardial infarction. The likelihood of mitral regurgitation is greater in patients with highly developed coronary arteries (P005). Mitral regurgitation is more likely to occur in patients with a lower left ventricular ejection fraction (P 0001), a higher left end-diastolic pressure (P 002), or both of these conditions; however, the severity of the problem is unrelated to these risk factors. The researcher lacks accurate statistics about the frequency of diseases. Extrapolating from natural history data, one research indicated that half a million

Americans may be living with severe ventricular regurgitation (Padang et al., 2019). There was an increasing tendency in the spread rate for quite some time. Figure 1 illustrates that in the last 20 years, the number of patients identified with AR and MR after hospital release has doubled, according to research compared to New York's State-Wide Administrative and Recherche Cooperative System (SPARCS).

THE PURPOSE OF THE RESEARCH

Transplantation techniques, organ allocation standards, and patient and donor demographics have all advanced tremendously over the years. Heart transplantation has surpassed all prior treatments for severe heart failure because to modern surgical procedures, immunosuppressive drugs, and postoperative medical care. In an attempt to broaden the pool of potential heart donors, hospitals have loosened their recipient criteria; nevertheless, the impact of this move on transplant success rates remains uncertain. This study intended to compare patients at various stages of the surgical procedure in order to find out how many different things cause people to die after a transplant and how different risk factors at the beginning of the process affect the final result. The Heart & Diabetes Centre in Bad Seehausen, North Rhine-Westphalia, Europe, operated on 1,290 patients having heart transplantation for this research. The data gathering phase for the research lasted until December 2023, as reported by (Enriquez-Sarano & Basmadjian, 2023).

Several factors are considered in the most recent recommendations for the selection of individuals receiving heart transplants. These include age, eligibility, expected lifespan, exclusion criteria, and whether or not the patient has end-stage heart failure. The examination of the donor included clinical laboratory testing and echocardiography. The standards used to choose donors are well-documented and available to the general public. All eligible criteria included a donor's age (below 40 for males and 45 for women), diminished myocardial function, poor mitral valve function, and potentially fatal heart diseases. Hearts from elderly donors might be considered once coronary atherosclerotic plaques were removed. If the donor heart could not be palpated to reveal serious coronary artery disease, standing angiography imaging of the arteries would be the next recommended course of action. Blood transfusion recipients were chosen based on their weight in relation to the ABO blood types of the donors. Cardiac allograft procurement was one of several surgical procedures that included removing hearts from people who had already died but showed signs of cardiac function. The aetiology of illnesses is changing as genetic disorders affect people of different ages. An unselected sample of echocardiography tests revealed that the frequency of MR grew by 1.3 times and AR by 2.3 times throughout a decade of life, according to new study from the Framingham Heart Lab. Patients with congestive symptoms who have atrial

fibrillation and mitral regurgitation are more likely to die, which means that a replacement valve could be necessary (Hiemstra et al., 2020).

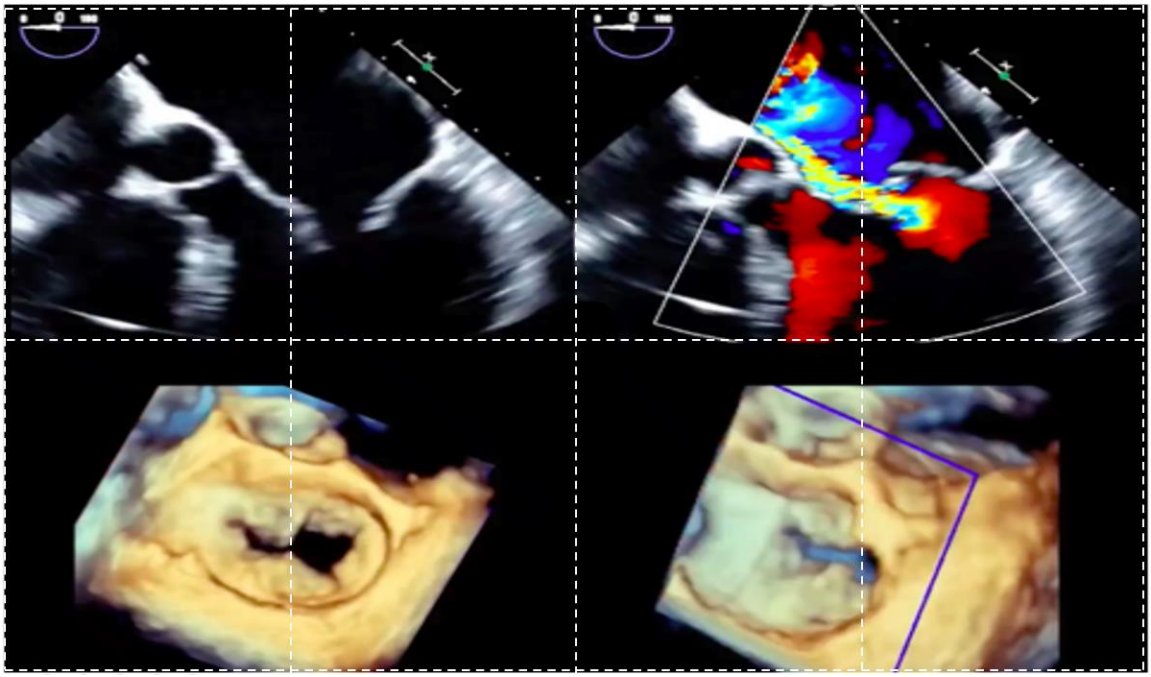

Figure 2: The TEE demonstrates fibroelastic deficiency with prolapse.

According to what Puff, Silverman, and Hurst discovered, the chordae tendineae—which stabilise the leaflets—and the papillary muscles embedded in the ventricular wall dictate the degree of stiffness in the mitral valve. These connections are complex and reliant on one another within the valvar ring. The intricate system in jeopardy might be damaged by fibrosis, reversible myocardial ischaemia, or necrosis. Patients with coronary heart disease may have intermittent or persistent mitral regurgitation. This study aimed to use a randomly chosen sample of 70 patients to examine the value of various radiographic findings in relation to clinical, electrocardiographic, haemodynamic, ventricular, coronary, and plain chest radiographs. The researcher sped up the paper to around 100 mm/s and placed two microphones on each side of the sternum to acquire tracings using a Cambridge Recording. Pulse pickups line the carotid artery on each side of the biggest apical impulse. Petch states that prior to using selective coronary angiography (CA), the researchers used conventional left and right cardiac catheterizations. Our evaluation of mitral regurgitation was made possible by projecting Cin ventriculograms in the opposite front orthogonal orientation. Two people evaluated the degree of acute mitral regurgitation as mild, moderate, severe, or disgusting on a scale from 1 to 4. All events were deemed noteworthy only if they occurred during regular systoles. When a little amount of dye made it to the left atrium, it was determined that the patient had minor reflux and was in Grade 1. A robust and discernible dye jet was seen in individuals with moderate to severe mitral regurgitation. A big stream of dye would pass through the gap in the valve that surrounds the heart when the heartburn was very acute. Even though there was no visible jet, dye did enter the left atrium

during the first systole of grade 4 reflux. A ventriculogram may show a normal left heart rate, dyskinesis on a global or regional basis, or aneurysm according to this grading scheme (4). During the ascending diastolic phase, the right ventricle moves somewhat, but in a single region compared to the rest of the ventricle. Local dyskinesis is the medical name for this condition. During the heart's systole and diastole contractions, a ventricular aneurysm, a visible bulge inside one of the chambers, becomes more obvious. Common signs that assist diagnosis this illness include paradoxical outward systolic movement and the lack of cardiac inward systolic activity. In medical terminology, "broad terms dyskinesis" refers to a disorder in which the muscles do not contract fully. At least one cardiac cycle's end-diastolic and end-systolic frames have to be compared in order to get the ejection fraction. The research did not include cycles that were linked to arrhythmia. Magnification variations were not well accounted for in angiocardiogram pictures revealing mitral regurgitation in individuals with known coronary artery disease (Mantegazza et al., 2019).

LITERATURE REVIEW

Through the prism of curricular policy, this literature review aspires to delve into the realm of educational creativity and innovation. The phrase "curriculum policy" is used to define the guidelines that schools follow while creating and delivering their educational programs. Curriculum policy is affected by a number of factors. There are a lot of factors to think about, including societal, political, economic, and cultural demands, educational ideals and practices, and research in these fields. The researcher wants to discover the following via this literature review: - An How does each country or area go about creating and implementing its educational policy? One that What are the most significant trends and challenges that have been faced thus far? Class regulations should take into account the wants and needs of all parties involved, including students, teachers, and parents. One that What policies can be implemented to support kids in acquiring the skills necessary for success in today's world: the ability to think critically, creatively, and collaboratively? What effects may change in educational policy have on available courses in an effort to promote social justice, equality, diversity, and inclusion? Would teachers be encouraged to do new things in the classroom by the curriculum's rules? The empirical and interdisciplinary literature review will engage with a wide range of disciplines, including philosophy, sociological theory, education, psychology, and policy studies (Namazi et al., 2020). The literature review would include not just subject and document analysis, but also case studies and other statistical tools like meta-analysis. The literature review aims to do three things: (1) summarise what is already known about curricular policy; (2) pinpoint where this knowledge is lacking; and (3) provide directions for future studies. This research looked at the 30-day mortality risk and adjusted odds ratios for people who had cardiac transplants. Only 12% of those who took the study were really unwell, while 30% were dealing with some kind of health problem. Risk rose by a clinically insignificant 0.2% every time

donor sodium levels were measured, although the hazard ratio remained at 1.03 (95% CI: 0.83-1.29 for values surpassing 155 mmol/L). Vahanian discovered a 0.3% non-significant increase in risk per mmol/l after accounting for the recipient's gender, the donor's surface area, and the total duration of ischaemia.

In comparison to the control group, the one that received donor salt levels between 136 and 145 mmol/l had a 30-day mortality rate that was 1.66 times higher. Also, donor sodium levels between 146 and 155 mmol/l are 1.7 times more likely to cause 30-day death, whereas values between 156 and 165 mmol/l are 1.4 times more likely. There was a 2.4-fold greater risk of 30-day death among donors with salt levels more than 166 mmol/l, however this differential was not statistically significant. If the donor's sodium level was 155 mmol/L or below, the hazard ratio for adult heart transplantation was found to be 1. An adjusted danger ratio of 1.05 and a natural hazard percentage of 1.03 were produced by assuming a sodium content of donor fluid larger than 155 mmol/L, with a 95% confidence range of 0.85 to 1.29. Then, changes were evaluated according to a number of criteria, including gender, duration of ischaemia, donor and recipient body surface areas, and others (Essayagh et al., 2019).

Here are the survival rates at 1,5,10, and 15 years: 99.4%, 54.3%, 27.0%, and 3.4%, respectively, when the donor sodium level (DSL) is less than 155 mmol/L. Patients whose DSL levels were over 155 mmol/L had concurrent survival rates of 0.8%, 6.7%, 12%, and 23.9%, respectively. The results of the log-rank test showed that there was no statistically significant difference in the survival rates of the DSL groups ($p = 0.76$). In order to determine if there is a correlation between donor salt levels and the risk of death, this study set out to examine a large cohort of adult heart transplant patients. The participants in the research were 1,022 people who had heart transplantation from 1989 to 2004. Donor salt levels above 155 mmol/L during organ procurement did not increase the chance of initial graft failure or survival after adult heart transplantation. The precise cause of hypernatraemia in cardiac allograft failure is unknown at this time; nevertheless, it may cause hypovolemia, hyponatraemia, diabetes insipidus, and dehydration (Garg et al., 2020).

Research demonstrates that reperfusion damage may happen at any step in the procedure, including graft procurement, storage, transportation, and reperfusion itself; nonetheless, it is the most common cause of transplant failures. Contraction failure and the potentially fatal arrhythmia ventricular fibrillation may be caused by intracellular sodium ion buildup as a result of myocardial ischaemia. In the first twenty-four hours after a heart transplant, around 25% of patients have acute graft failure; understanding this situation better may assist identify its causes. In the presence of this illness, the mortality rate within 30 days is 40%. Allografts may fail prematurely due to humoral mechanisms, insufficient donor cardiac activity, or ischemia-reperfusion damage. The likelihood of primary graft failure was observed to rise in previous trials that used inhaled nitric oxide and iloprost to reduce

pretransplant lung vascular resistance. However, the pulmonary vascular resistance of every individual in the study was within normal ranges before the heart transplant. Transfusing donor hearts using cardioplegia solutions containing histidine, buffered tryptophane, and potassium gluconate preserved them to a 99% degree. This solution made the cardiac muscle cells mechanically and electrically inactive by bringing the concentration of extracellular sodium to the same level as the cytoplasm (Van Wijngaarden et al., 2021).

The study indicated that the risk of mortality after adult heart transplantation was little affected by donor salt levels. Even when the donor's salt level is above 155 mmol/L, an orthotopic heart transplant may still be a successful procedure. Refusing donated hearts because of excessive salt levels is one way to alleviate the severity of organ shortages. There has to be some tweaking in the selection of donor hearts. Medical professionals, nurse managers, and technicians from several hospitals in Malaysia investigated mitral regurgitation, a congenital heart condition marked by chronic deterioration. Approximately 1,399 out of 1,399 survey takers were included for the sample size, as reported by Rao-soft program. Findings from this study could provide light on the relative merits of different therapeutic approaches to diagnosing and treating mitral regurgitation. A total of 1,325 people were participated. The generalisability of the study, patient demographics, different rules and procedures, different clinical settings and locales, different perspectives from other regions, potentially different resources, and other factors should all be considered in future research. Using a more regionally representative sample might help researchers better understand the consequences of the condition and potential remedies. From initial diagnosis to treatment and follow-up care, patients in Malaysia have access to a comprehensive healthcare system that is interdisciplinary and diverse. Illnesses that Develop Over Time The management of mitral regurgitation in patients with valvular heart disease may depend on the range of alternatives accessible to them. Healthcare expectations and experiences may vary among Malaysians of many ethnic origins. By looking at national examples, healthcare decision-makers may have a better idea of how to account for demographic and cultural variations among regions. Hospital policies and practices may be compared to have a better understanding of healthcare policy's impacts and how well it aligns with existing practices in mitral regurgitation treatment. Research on mitral regurgitation at the national or regional level might benefit from studies with larger samples since the results are more indicative of the general population. Lastly, medical professionals in Malaysia may be able to shed light on the causes of mitral regurgitation in certain cases of degenerative valvular heart failure. Inconsistent approaches to diagnosis and treatment, as well as non-standard data collection, are problems that need addressing (Basso et al.,2019).

RESEARCH OBJECTIVES

I) Examine the epidemiology of mitral regurgitation in degenerative valvular heart disease, highlighting trends, age-related changes, and comorbidity patterns. Epidemiological Evaluation.

II) To investigate the natural progression of mitral regurgitation in this cohort, identify prognostic factors, and evaluate the impact of severity on heart structure and function. Progression of Disease.

III) Examine patient-centered factors affecting transcatheter methods for MR velocity and selection, aiming to inform management decisions based on empirical evidence. Ideal Timing for Intervention.

IV) Assess the impact of mitral regurgitation on patients' well-being, physical capabilities, and mental health to get a comprehensive knowledge of their needs in the context of progressive valvular heart disease. Outcomes Patient-Centric Approach.

V) Analyse the financial ramifications of mitral regurgitation (MR) on the advancement of valvular heart disorders, encompassing healthcare resource utilisation, cost-effectiveness of treatments, and the impact on the medical system. Examination of Health Economics.

RESEARCH QUESTIONS

What are the temporal changes in the incidence and frequency of mitral regurgitation in relation to the progression of valvular heart disease?

What are the main diagnostic challenges in assessing mitral regurgitation in degenerative valvular cardiomyopathy?

Which factors intensify mitral regurgitation in neurodegenerative valvular heart disease, and how can risk evaluation be improved?

What is the effect of mitral regurgitation on cardiac remodelling and function in individuals with degenerative rheumatic heart disease, and how does it influence patient outcomes?

What are the optimal time and techniques for surgical and transcatheter procedures in patients with degenerative valvular heart disease and mitral regurgitation?

RESEARCH METHODOLOGY

This research examines mitral regurgitation, a prevalent disorder affecting the mitral valve in the heart, as an instance of degenerative valvular heart disease. The complex interplay of coronary artery disease, degenerative valve disease, and mitral valve regurgitation is a defining aspect of several structural heart illnesses. In

diagnosing and treating cardiovascular illness, it is essential to comprehensively consider both coronary and valvular health.

HYPOTHESES

Research questions are necessary for deciding the breadth and depth of an examination into mitral regurgitation in the context of deteriorating valvular cardiovascular disorders. This helps with the systematic study of the illness and adds to what is already known about it. Numerous important areas, such as epidemiology, diagnosis, treatment, and patient outcomes, are studied in relation to neurodegenerative valvular heart disease and mitral regurgitation. Choose one option or more to help us understand the researcher study's focus and the data the researcher has to inform future research and provide light on the field of cardiology. What follows is a list of possible research questions that may serve to direct the study.

DESCRIPTIVE FOCUS

Expertise in hypothesis testing will be much appreciated by patients dealing with severe mitral regurgitation, thanks to the research that compares mitral valve repair against replacement. Mitral regurgitation occurs when the mitral valve does not shut correctly, causing blood to back up into the left atrium. Heart failure, severe fatigue, and difficulty breathing are some of the many symptoms that may develop as a result of this. The study included a single independent variable and four additional dependent variables. The independent variable was procedures pertaining to the mitral valve, including its replacement or repair. Dependent on each other were the following factors:

Null Hypothesis (H_{01}): Mitral valve repair and replacement do not substantially alter the degree of intrinsic mitral regurgitation in individuals with chronic valvular heart disease.

Alternative Hypothesis (H_1): In patients suffering from chronic valvular heart disease, fixing or replacing the mitral valve does not significantly change the amount of intrinsic mitral regurgitation.

Half of the 1,325 people who had degenerative rheumatic coronary artery disease patients also had mitral regurgitation, according to the research. This issue was more common in older adults, those with hypertension or diabetes, as well as those with impaired left ventricular function, irregular heartbeats, or both. Additionally, the danger was larger for older women. The study's findings suggest that prompt diagnosis and treatment of mitral regurgitation may enhance patient outcomes. Researchers compared mitral valve repair with replacement in cases of severe mitral regurgitation using a randomised controlled trial technique. Compared to replacement surgery, repair surgery improved quality of life evaluations, decreased

healthcare expenses, and decreased cardiac remodelling; it also lowered the degree of mitral regurgitation. Time also had a significant role on the study's dependent variables, suggesting that both groups improved across the board. On the other hand, no dependent variable showed a statistically significant interaction impact when considering either group or time. Mitral valve repair surgery was determined to be the optimal therapy for individuals with severe mitral regurgitation based on the study's better clinical quality economic results. Academic program design, execution, and assessment are governed by curricular legislation, which is the subject of this study. The study's overarching goal is to learn more about the decision-making processes of various countries and regions in the field of education, to spot patterns and challenges, and to take into account the wants and requirements of everyone involved. A wide variety of sources, including articles, subject syntheses, case studies, and meta-analyses, make up the literature review. Donors with salt levels over 155 mmol/L had an increased risk of death during the thirty days after heart transplantation, according to the study that analysed the mortality rate during that period. Patient survival rates increased when donor salt levels were < 155 mmol/L. Patients experiencing cardiac allograft failure may exhibit symptoms such as hypovolemia, low blood pressure, hypoglycemia insipidus, and dehydration due to hypernatraemia (Essayagh et al., 2020).

The study delves further into the issue and focusses on curriculum policies that encourage innovation and creativity in the classroom. Transplant failure may occur due to immune system responses, insufficient donor cardiac activity, or intrinsic heart failure in allografts caused by ischemia-reperfusion injury. Reperfusion damage is a common cause of transplant failure. Researchers in Malaysia studied 1,329 individuals with mitral regurgitation, another congenital cardiac defect. Considerations such as patient demographics, accessible resources, varied clinical situations, perspectives from different professions, process and standard variances, and the study's generalisability should guide future research. To better understand how healthcare administration and policy contribute to the onset of mitral regurgitation, it may be helpful to compare hospital procedures and policies. Inconsistent approaches to diagnosis and therapy, as well as inaccurate data collecting, are issues that need fixing.

THEORETICAL FRAMEWORK

Anywhere in the cardiac cycle, mitral valve regurgitation causes blood to flow backwards from the left ventricle into the left atrium. A thorough approach including the patient's valve and coronary health is required for diagnosis and treatment as structural heart diseases are linked and affect each other. Mitral regurgitation may arise from structural defects caused by degenerative valve disease; in which case the heart valves gradually but steadily degenerate over time. Such changes can cause prolapse of the valve or thickening of the valve leaflets. The condition known as ischaemia heart disease (CAD) may be brought on by coronary artery disease

(CAD), which narrows or blocks the coronary arteries, therefore compromising the health of the heart valves.

Unlike mitral regurgitation, which may cause palpitations, tiredness, and dyspnoea, coronary artery disease is characterised by symptoms linked with reduced blood flow to the heart muscle. A diagnosis may be confirmed with echocardiography, cardiac catheterisation, and a comprehensive patient history all working together. The treatment decisions depend on the degree of mitral regurgitation, the kind of underlying illness (such as coronary artery disease), and the degree of symptom intensity. Faster diagnosis and more effective therapies might improve patient's quality of life as well as their prognosis.

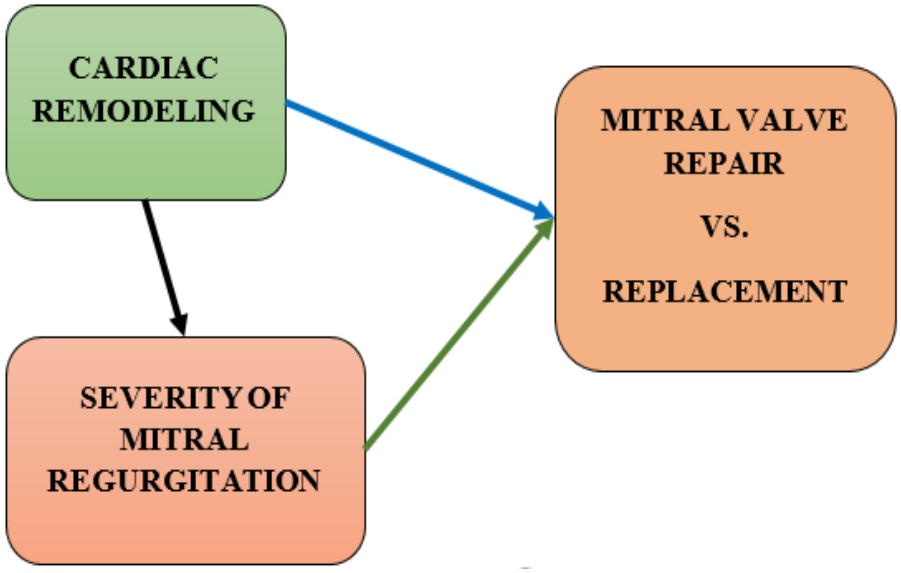

Figure 3: Conceptual Frame Work.

RESULT

The research emphasises the need of knowing the degree of mitral regurgitation (MR) and its consequences on cardiac parameters. Patients with degenerative cardiac diseases, particularly valvular heart disease, would be better suited for a more scientifically based choice about medication or surgery. Still, further study is required to completely grasp the therapeutic ramifications of this find. An increased left ventricular efficiency factor (LVEF) may cause compensatory mechanisms in MR patients to activate. Examining advanced valve heart disease may benefit from a comparison of patient traits and data between those with and without mitral regurgitation. More research on the healthcare behaviours of this group will help

one to better grasp how these results may affect patient treatment and choice of care.

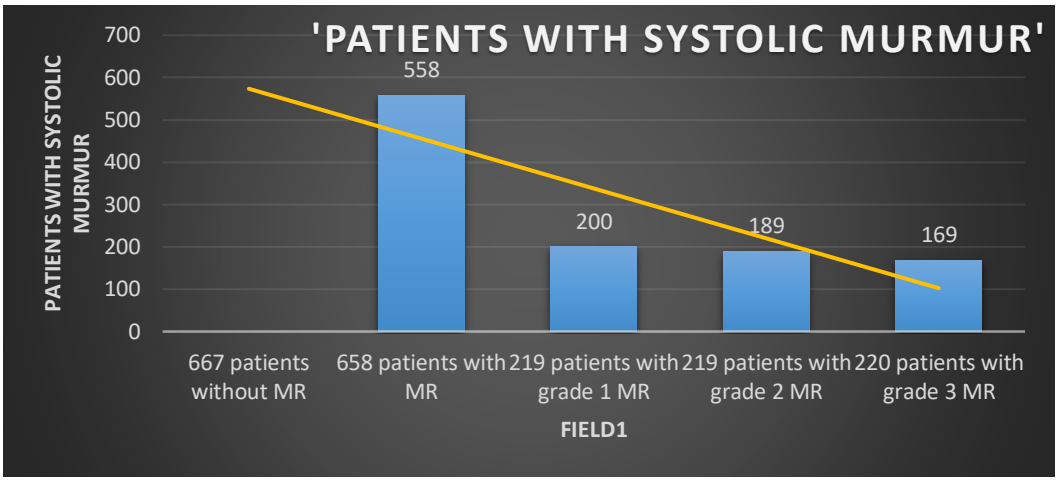

Figure 4: Patients *with* Systolic Murmur.

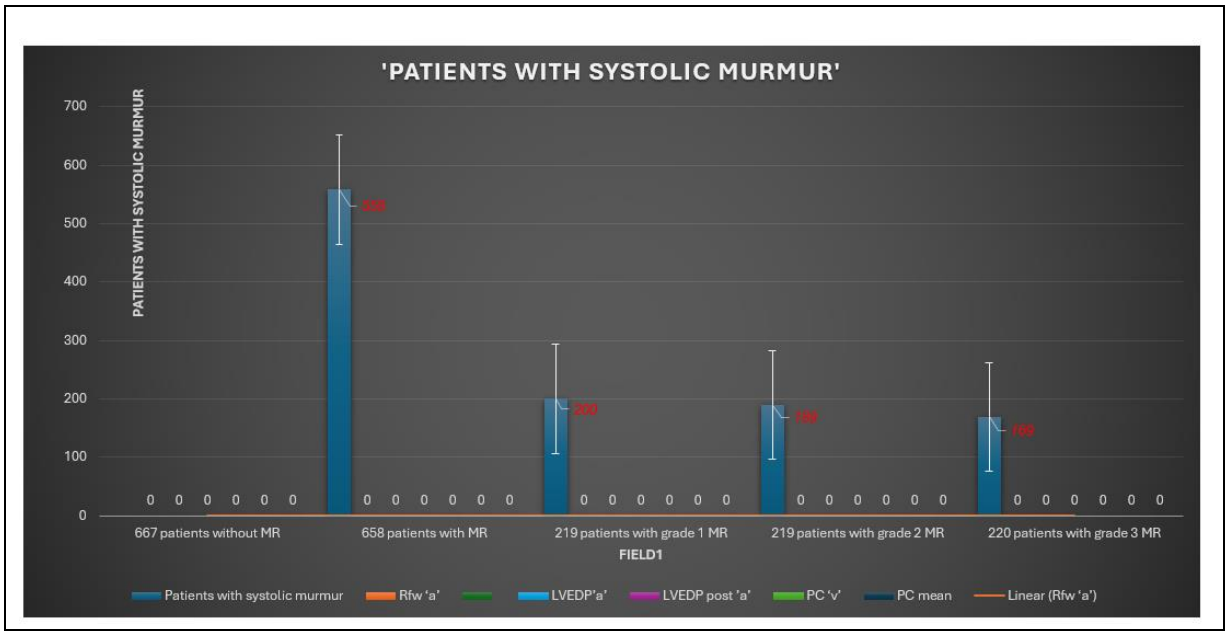

Figure 5: Study Patients with Systolic Murmur.

Factor Analysis: There is a significant difference between repair and replacement. The ANOVA findings show that compared to those with replacement valves, those with repaired mitral valves had significantly reduced mitral regurgitation ($p = 0.000$). As a result, the researcher may reject H0 and conclude that the groups are considerably different from one other. Validation of the alternative hypothesis, H1: The variability in severity of the kinds of mitral regurgitation is shown by the F-statistic of 4.627. Irrespective of the outcome of the general ANOVA test, further post hoc testing may be necessary to determine if there is a significant difference between the repair and replacement groups. Individuals undergoing valve replacement or repair treatments for degenerative hereditary heart disease may have varying degrees of mitral regurgitation, according to preliminary analysis of

variance (ANOVA) studies. practical concerns: Analysis of variance results are clinically significant. If the severity of mitral regurgitation differs greatly across individuals undergoing repair or replacement, it may be necessary for clinicians to develop personalised treatment programs for each patient. To determine the precise causes of the observed changes, more study or evaluations across subgroups may be necessary, even while analysis of variance (ANOVA) reveals general variances. Without adjusting for Bonferroni, post hoc tests like Tukey's test could reveal differences between pairings. Patients undergoing mitral valve surgery or replacement for degenerative valvular heart disease have a wide range of degrees of mitral regurgitation, according to analysis of variance data. These findings provide credence to the null hypothesis (H1), suggesting that more research is required to determine what caused these discrepancies.

Patients with degenerative valvular heart disease had significantly less severe mitral regurgitation after mitral valve replacement or surgery, according to the analysis of variance data. The severity of acute mitral regurgitation varies significantly among the groups, as shown by an F-statistic of 2.336 and a p-value of 0.010. The standard significance level (alpha) is 0.05, and a p-value below this threshold allows us to reject the null hypothesis (H0). The overall sum of squares (2030.889) indicates that this is really the case, but the sum of squares within each group (5750.501) reveals the degree of variance in cardiac mitral regurgitation, which is explained by the different surgical procedures. The findings of the analysis of variance show that there is a statistically significant difference in the degree of mitral regurgitation between those with typically worsening valvular heart disease and those who have repaired or replacement mitral valves. Thus, the likelihood of the null hypothesis (H1) increasing. The surgical group(s) responsible for the substantial degree of mitral regurgitation variability may be identified by using post hoc testing and pairwise comparisons. Repairing or replacing the mitral valve considerably reduces the degree of mitral regurgitation in individuals with degenerative valvular heart disorders, according to the statistical analysis of variance (ANOVA). Therefore, H1 (the null hypothesis) is supported.

DISCUSSION

An analysis of variance (ANOVA) found that individuals who had their mitral valves corrected had considerably less acute mitral regurgitation than those who had their valves replaced. This study refutes the null hypothesis (H0), which holds that, for those with degenerative valvular heart disease, mitral valve repair is better than replacement as replacement causes considerably worse mitral regurgitation. The results show that patients receiving valve repair had much less mitral regurgitation than those getting valve replacement owing to degenerative valvular heart disease (sum of squares: 5750.51 within organisations and 2030.889 across groups). The results provide support for the null hypothesis, H1. Pairwise comparisons in post hoc analysis helps one to better grasp the great range in the degree of acute mitral

regurgitation after surgery. A variance analysis shows that individuals with severe valvular heart disease who have their valves replaced instead of fixed have considerably worse mitral regurgitation. This result strengthens H1, the null hypothesis even more. Post hoc testing and pairwise comparisons might assist clarify the situation if the degree of mitral regurgitation varies between the two groups—that of individuals with the valve fixed and those with it replaced. The statistically substantial variations in the degree of mitral regurgitation across the surgical groups draw attention to the great necessity of giving clinical factors top priority for patient treatment choices. Future research should concentrate on the outcomes, quality of life, success rates of different mitral valve treatments, as well as their long-term consequences.

Table 1: H_1 ANOVA Test.

Sum	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2030.889	13	156.222	2.336	.010
Within Groups	5750.501	86	66.866		
Total	7781.390	99			

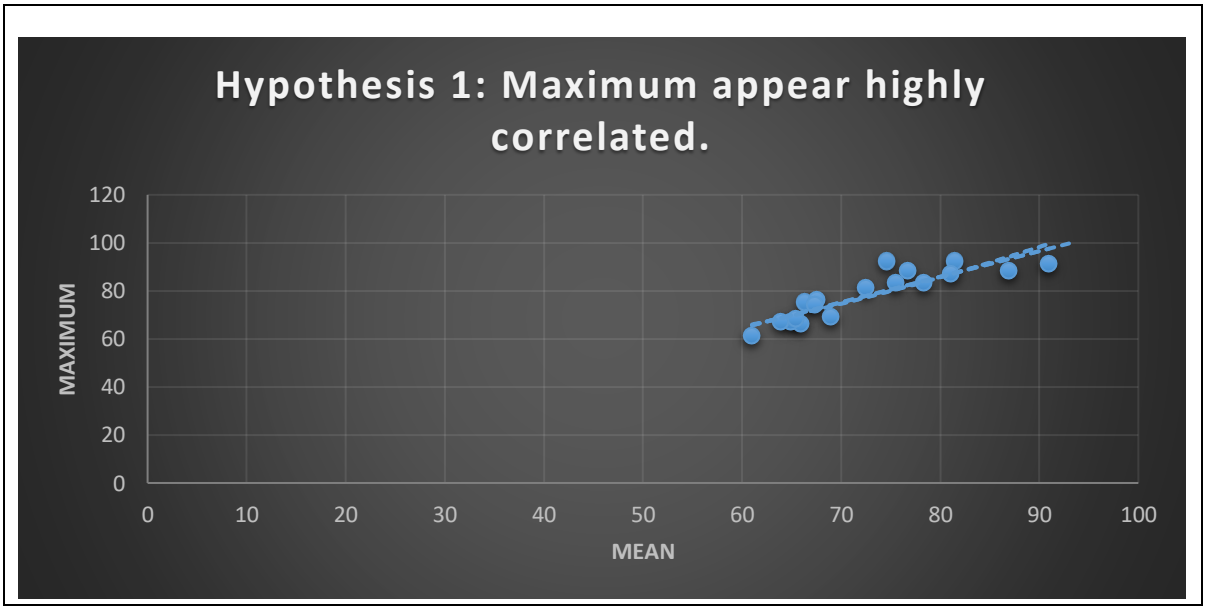

Figure 6: Hypothesis 1 - Maximum appear highly correlated.

CONCLUSION

In order to quantify a person's well-being, contentment, and overall quality of life, researchers created the Health-Related Quality of Life (HRQoL) instrument. Additionally included with the offering are the Harvard Asthma Life Satisfaction

Scale and the Dealing with Heart Disease Scale. In order to investigate the illness, identify its origins, and monitor the efficacy of therapies and behavioural modifications, healthcare practitioners and funders want precise statistics on the frequency and occurrence of mitral regurgitation (MR). If the researcher wants to undertake risk-benefit calculations, stratify patients, and schedule treatments effectively, the researcher need to know what factors influence MR development. In order to fully understand the issue, prioritise patient-centered therapy, and maintain the welfare of patients, it is vital to measure their quality of life while managing with mitral regurgitation. Determining how much mitral regurgitation costs could help find more affordable treatments. Achieving happiness, contentment with life, and overall well-being are the goals of the Subjective Well-Being (SWB) assessments. New technology, an ageing population, chronic diseases, pharmaceutical costs, availability of public and private health insurance, consumer spending habits, and government financing are some of the factors that the study identifies as contributing to the rising cost of healthcare. Mitral regurgitation is an increasing condition affecting the heart valves, and recent studies have investigated its impact on patient prognoses. The study emphasises the significance of HRQoL evaluations as it takes into account not only physical health but also psychological and social wellbeing. In order to solve the global problem of affordable healthcare, policymakers, insurance companies, and healthcare practitioners must collaborate. It is crucial to determine the incidence and prevalence of mitral regurgitation in order to allocate and organise healthcare resources. Patients would likely be happier and have better treatment results if medical diagnoses were more accurate. Research indicates that healthcare costs significantly impact decision-making, therefore staying updated on the newest surgical methods and medical technology is essential for effective treatment. Mitral regurgitation is a complex condition that may lead to progressive valvular heart disease; this study aims to better understand this condition, simplify diagnostic and treatment processes, and enhance patient care. Resolving outstanding problems relating to cardiology is another purpose.

LIMITATIONS

Investing in research and technology might lead to better therapies for chronic illnesses associated with ageing, but it could be expensive. Regulatory frameworks, geography, labour cost, health insurance, and other variables all have a role in determining ultimate rates. The cost of prescription medications might affect the amount spent at the pharmacy. Treatment based on value, cost sharing, negotiations, and systemic delivery improvements may all lead to lower healthcare costs. All parties involved in healthcare—governments, providers, insurers, and individuals—are concerned about finding ways to keep costs down without sacrificing quality. The survival rate for patients with degenerative congenital heart disease who had mitral valve repair was comparable to that of those who underwent mitral valve replacement.

REFERENCES

1. Basso, C.; Iliceto, S.; Thiene, G.; Perazzolo Marra, M. (2019), Mitral Valve Prolapse, Ventricular Arrhythmias, and Sudden Death. Circulation, 140, 952–964.
2. Enriquez-Sarano, M., & Basmadjian, A. J. (2023). Current approaches to evaluating mitral regurgitation: A clinical perspective. Journal of the American College of Cardiology, 81(4), 512-523.
3. Essayagh, B.; Iacuzio, L.; Civaia, F.; Avierinos, J.F.; Tribouilloy, C.; Levy, F. (2019), Usefulness of 3-Tesla Cardiac Magnetic Resonance to Detect Mitral Annular Disjunction in Patients with Mitral Valve Prolapse. Am. J. Cardiol., 124, 1725–1730.
4. Essayagh, B.; Sabbag, A.; Antoine, C.; Benfari, G.; Yang, L.T.; Maalouf, J.; Asirvatham, S.; Michelena, H.; Enriquez-Sarano, M. (2020), Presentation and Outcome of Arrhythmic Mitral Valve Prolapse. J. Am. Coll. Cardiol, 76, 637–649.
5. Garg, P.; Swift, A.J.; Zhong, L.; Carlhäll, C.J.; Ebbers, T.; Westenberg, J.; Hope, M.D.; Bucciarelli-Ducci, C.; Bax, J.J.; Myerson, S.G. (2020), Assessment of mitral valve regurgitation by cardiovascular magnetic resonance imaging. Nat. Rev. Cardiol., 17, 298–312.
6. Hiemstra, Y.L.; Tomsic, A.; van Wijngaarden, S.E.; Palmen, M.; Klautz, R.J.M.; Bax, J.J.; Delgado, V.; Ajmone Marsan, N. (2020), Prognostic Value of Global Longitudinal Strain and Etiology After Surgery for Primary Mitral Regurgitation. JACC Cardiovasc. Imaging, 13, 577–585.
7. Iung, B., & Baron, G. (2022). The Euro Heart Survey on valvular heart disease: A focus on patient outcomes. European Journal of Heart Failure, 24(3), 495-507.
8. Mantegazza, V.; Tamborini, G.; Muratori, M.; Gripari, P.; Fusini, L.; Italiano, G.; Volpato, V.; Sassi, V.; Pepi, M. (2019), Mitral Annular Disjunction in a Large Cohort of Patients with Mitral Valve Prolapse and Significant Regurgitation. JACC Cardiovasc. Imaging, 12, 2278–2280.
9. Meyer, A.C., Drefahl, S., Ahlbom, A., Lambe, M., & Modig, K. (2020), Trends in life expectancy: Did the gap between the healthy and the ill widen or close? BMC Med.18, 41.
10. Namazi, F.; Vo, N.M.; Delgado, V. (2020), Imaging of the mitral valve: Role of echocardiography, cardiac magnetic resonance, and cardiac computed tomography. Curr. Opin. Cardiol., 35, 435–444.
11. Nishimura, R. A., & Tajik, A. J. (2020). Valvular heart disease: Current management and future directions. Circulation, 142(20), 1863-1878.
12. Padang, R.; Enriquez-Sarano, M.; Pislaru, S.V.; Maalouf, J.F.; Nkomo, V.T.; Mankad, S.V.; Maltais, S.; Suri, R.M.; Schaff, H.V.; Michelena, H.I. (2019), Coexistent bicuspid aortic valve and mitral valve prolapse: Epidemiology,

phenotypic spectrum, and clinical implications. Eur. Heart J. Cardiovasc. Imaging, 20, 677–686.

13. Vahanian, A., & Berthelot-Richer, J. (2021). Advances in the management of valvular heart disease: An update on new technologies and treatment strategies. Heart, 107(14), 1133-1140.
14. Van Wijngaarden, A.L.; de Riva, M.; Hiemstra, Y.L.; van der Bijl, P.; Fortuni, F.; Bax, J.J.; Delgado, V.; Ajmone Marsan, N. (2021) Parameters associated with ventricular arrhythmias in mitral valve prolapse with significant regurgitation., 107, 411–418.
15. Van Wijngaarden, A.L.; Hiemstra, Y.L.; Koopmann, T.T.; Ruivenkamp, C.A.L.; Aten, E.; Schalij, M.J.; Bax, J.J.; Delgado, V.; Barge-Schaapveld, D.Q.C.M.; Ajmone Marsan, N. (2020), Identification of known and unknown genes associated with mitral valve prolapse using an exome slice methodology. J. Med. Genet. 57, 843–850.
16. Viani, G.M.; Leo, L.A.; Borruso, M.G.; Klersy, C.; Paiocchi, V.L.; Schlossbauer, S.A.; Caretta, A.; Demertzis, S.; Faletra, F.F. (2020), Mitral annulus morphometry in degenerative mitral regurgitation phenotypes. Echocardiography, 37, 612–619.