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AYURVEDIC APPROACH AND EMERGING NOVEL THERAPIE OF ANGINA PECTORIS

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ABSTRACT

An organ is an independent gathering of tissues that carries out a particular role in the body. Heart diseases have posed a great challenge in developing countries. Heredity, high blood pressure, diabetes, high serum cholesterol, smoking, improper diet, and stressful lifestyles are the factors, which are responsible for heart diseases. There are a few distinct kinds of coronary disease , and they influence the heart and vessels in various ways. Ayurveda believes that heart diseases are due to the imbalance of three doshas and bringing the normal levels of these tridoshas back to normal will be a major step in the management of heart diseases. In the paper, some of the allopathic and ayurvedic remedies, useful in treating heart diseases, have been summarized.

KEYWORDS: Angina Pectoris, First-line anti-anginal medications**,** angina attacks, Hridroga, hypertension.

INTRODUCTION

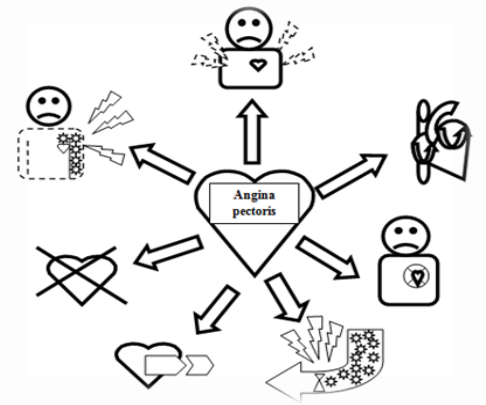

Fig. 1.1 Angina Pectoris.

Angina pectoris is a medical ailment that develops when the amount of oxygenated blood delivered to your heart is insufficient. This is frequently caused by cholesterol deposits obstructing the blood arteries that transport blood to your heart. Angina pectoris puts patients at risk for a heart attack. The most common symptom of angina pectoris is chest pain beneath the breastbone. Chest pain is most frequent during exercise, physical work, or sexual activity. It can feel like pressure, squeezing, burning, or tightness. Chest pain can also be triggered by emotional stress, chilly weather, or dreams. Patients with severe angina pectoris may experience discomfort even when they are not under any stress. Angina pectoris causes chest discomfort that can last anywhere from 5 to 30 minutes. Angina is a common presenting symptom (usually chest pain) in people with coronary artery disease. Women are significantly more likely than men to suffer from angina pectoris. Furthermore, Angina in women can manifest in a variety of ways. It's possible that the pain isn't in the chest area, and that it's at a different location. It is critical that one alteration be made in order to improve the prognosis. The way of life if not, one should stick to the adjustments. Angina attacks will recur. The most effective preventive methods are: include - beginning an exercise regimen - quitting smoking - reducing your weightless consumption of alcohol - avoiding tense situations - avoiding heavy lifting as well as greasy meals Angina is best treated with medication. Nitroglycerin is the most prevalent class of medicines used to treat angina. Nitroglycerin can be found in a variety of forms. It can be consumed orally, inserted beneath the tongue, or even delivered intravenously. Nitroglycerin has the potential to widen blood vessels, allowing more blood to reach the heart. When a person feels chest pain coming on, they usually take nitroglycerin. A tablet is inserted behind the tongue, and the discomfort goes away in a matter of minutes. Two pills may be required in some circumstances. For decades, beta-blockers have been used to treat coronary artery disease. They work by reducing the work of the heart and, as a result, lowering oxygen use. Unfortunately, unlike nitroglycerin, they work over time and not immediately. Beta-blockers must be used on a daily basis and have a number of negative effects, including a reduction in libido. Calcium channel blockers are particularly successful in the treatment of angina, but they must be given on a regular basis, just as beta-blockers.

PATHOPHYSIOLOGY

Definition

Pericardial discomfort or pressure caused by transitory myocardial ischemia without infarction is known as angina pectoris as shown in Fig No 1.1.[1]

कफपित्तावरुद्धस्तु मारुती रसमूर्च्छितः।

हृदिस्थः कुरुते शूलमुच्छ्वासारोधकम् परम् ॥

स हच्छूल इति ख्यातो रसमारुतसम्भवः ॥

सुश्रुत उत्तर स्थान ४२/१३२॥

Treatment

तत्रापि कर्माभिहतं यदुक्तं हृद्विकारिणाम् ॥

सुश्रुत उत्तर स्थान ४२/१३३॥

The pain of Hrit Shula can be compared to a modern condition known as Angina Pectoris. Angina Pectoris is a 'chest pain' or 'chest discomfort'.It occurs when a part of the heart does n ot receive enough oxygen and blood. It is also called 'angina'. It can also be a symptom of CAD (coronary artery disease). It may also be causedby other etiological factors. Thepatient may experience squeezing, pressure, heaviness or tightness in the chest [2]

ETIOLOGY

Angina pectoris occurs when cardiac workload and the resulting myocardial oxygen demand exceed the ability of coronary arteries to supply an adequate volume of oxygenated blood. When the arteries shrink, supply and demand may become unbalanced. Coronary artery atherosclerosis is the most prevalent cause of narrowing, but it can also be caused by coronary artery spasm or, in rare circumstances, coronary artery embolism. Acute coronary thrombosis can cause angina if the obstruction is mild or temporary, but it frequently leads to acute myocardial infarction (MI).[3]

Pathophysiology

1] Chronic stable angina

Stable angina (Angina pectoris) is a form of chest pain that occurs when your heart muscle requires more oxygen than usual but is unable to obtain it usually due to obstruction or spasm of the arteries that supply blood to the heart muscle.[4] This can happen when it’s cold outside or you’re exercising, for example Acute coronary syndrome can develop from stable angina, which is a brief chest pain.[5]

2] Unstable angina

Unstable angina (UA), also known as crescendo angina[6], is a type of angina that is not stable.Acute coronary syndrome, commonly known as unstable angina, is characterised by sudden chest discomfort that occurs while you are resting. The most common cause is reduced blood flow to the heart muscle due to fatty build-ups (atherosclerosis) in the coronary arteries, which can rupture and cause damage to the coronary blood vessel, causing blood clotting and limiting blood supply to the heart muscle.[7]

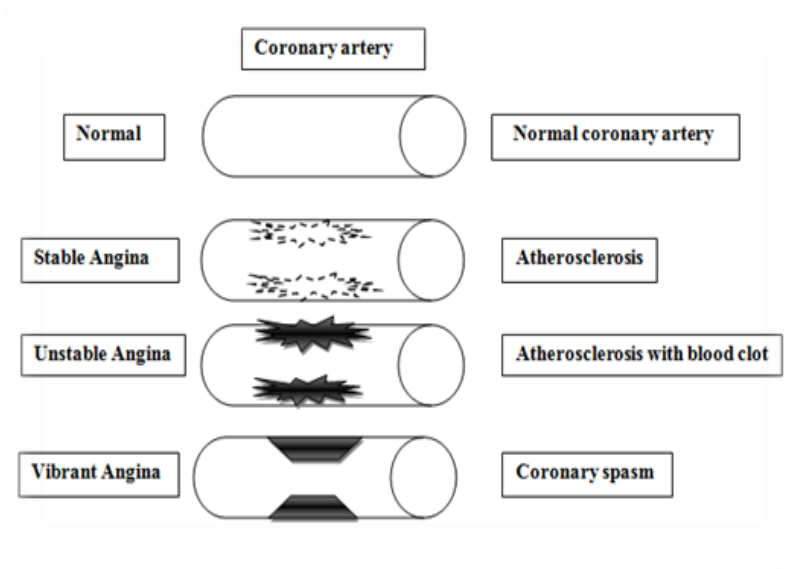

Fig. 1.2: Types of Angina Pectoris.

- **Symptoms**
- It is a painful ailment, although many patients describe it as a pressure, weight, tightness, squeezing, burning, choking sensation in their chest.
- In addition to the chest, angina symptoms might develop in the epigastria (upper central belly), back, neck area, jaw, or shoulders.[8]
- In certain circumstances, pain is accompanied by shortness, sweating, and nausea.
- The heart rate and blood pressure rise in this situation.[9]
- Some patients may experience atypical angina (e.g., bloating, gas, or stomach discomfort).[9]
- Discomfort are frequently attributed to indigestion in these people, and belchingmay even appear to alleviate symptoms.[10]
- Nocturnal angina may occur if a dream causes striking changes in respiration, pulse rate, and BP.

Diagnosis

1] Electrocardiogram (ECG)

It is a test that records the electrical activity of the heart and is used to diagnose heart disorders such as arrhythmias or to show ischemia (lack of oxygen and blood) in the heart.[11][12] It can determine how well the coronary arteries supply blood to the heart when it must work harder, and if the rhythm remains normal. The exercise stress test is generally safe.[12]

2] Stress testing

It is required to confirm the diagnosis, assess the severity of the disease, estimate the patient's suitable exercise levels, and predict prognosis.[13]

Blood testing: These tests can detect specific enzymes, such as troponin, which seep into the bloodstream after a heart attack or severe angina.

Blood tests can also detect high cholesterol, LDL, and triglyceride levels, which put you at a higher risk for coronary artery disease and, as a result, angina.[14]

ALLOPATHIC REMEDIES

The optimal treatment for angina is determined by the type of angina you have as well as other variables. If your angina is stable, lifestyle adjustments and medications may be able to help you manage it. Unstable angina necessitates prompt hospitalization for therapy, which may include medications and surgical procedures. Although the main concepts of treatment (e.g., lifestyle change and risk factor management) apply to all patients with angina, treatment should be tailored to the individual whenever possible. In order to ease symptoms and improve cardiovascular risk profile, it should seek to reverse or lessen the underlying pathophysiological causes. Lifestyle changes (smoking cessation, dietary changes, and increased physical activity), management of hypertension, diabetes, and obesity, and other secondary cardiovascular disease prevention measures, such as the use of antiplatelet and lipid-lowering agents, pharmacological antianginal therapies, and percutaneous and/or surgical revascularization when indicated, are all important interventions.[15][16]

- **First-line anti-anginal medications:-** β-adrenergic receptor blockers (beta-blockers) as shown in table no.1.1Table.

anti-anginal medications that have been found to prevent angina and myocardial ischemia in numerous trials.[17]

- **Treatment for chest pain:-** Sublingual glyceryl trinitrate is the best treatment for angina attacks (GTN). GTN causes systemic and coronary vasodilation by acting as a nitric oxide donor. GTN is rapidly absorbed in the sublingual mucosae, with effects appearing in 2–10 minutes.[17]

- **Anti-angina treatments that are used as a last resort:-** There are numerous choices for patients whose symptoms are not effectively controlled by beta-blockers and calcium-channel blockers, or who have contraindications to these medications. Vasodilators such as long-acting nitrates and nicorandil, a medicine that selectively decreases the heart rate; ivabradine, and ranolazine, an agent that improves cardiac metabolism by acting on the rapid sodium current. Pathogenic processes, patient features and co-morbidities, drug interactions, and patient preference all influence when and in what order these second-line drugs are used in clinical practice.[17]

Table 1.1: Allopathic remedies of Angina pectoris.[18-32]

Sr. no	Anti anginal agent	Target site	Mechanism of action	Dose	Side effects
1.	Abciximab	Glycoprotein	Inhibits platelet aggregation by preventing the binding of fibrinogen	0.25 mg/kg IV	Bleeding,blurred vision; confusion; dizziness, faintness.
2.	Amlodipine	Calcium channels blocker	Peripheral arterial vasodilator/decrease in blood pressure.	5 mg orally	swelling of the hands, feet, ankles, or lower legs, headache, upset stomach.
3.	Amyl Nitrite	Peptide receptor	Potent vasodilator. It expands blood vessels.	inhalations of the vapor	Bluish-colored lips, fingernails, or palms of hands dizziness (extreme) or fainting. feeling of extreme pressure in head. shortness of breath. weak and fast heartbeat.
4.	Atenolol	Beta-blocker	This effect lowers the heart rate, blood pressure, and strain on the heart	50 mg/day	cold hands or feet. difficult or labored breathing.
5.	Benidipine	Calcium channel blocker	Calcium channel blocker treat hypertension.	4 mg twice daily.	Constipation, nausea and abdominal discomfort. Ringing in the ear.
6.	Ivabradine	Cardiac pacemaker	Depolarization	5mg	fast or irregular heartbeat. lightheadedness, dizziness, or fainting. pounding in the ears
7.	Ranolazine	Sodium channels	Prevent salt overload in the cell by inhibiting late INa	500 mg	Bloating or swelling of the face, arms, hands, lower legs, or feet. chest tightness. difficult or labored breathing.

AYURVEDIC ASPECT OF ANGINA PECTORIS

Hritshoola is the Ayurvedic term for angina. It is made up of two words: hirday, which means "heart," and shool, which means "thorn" or "pain." As a result, the word hritshoola meaning "thorn in the heart." An exacerbated kapha dosha causes angina pectoris. In nature, Kapha is thick, dense, stable, sticky, damp, and cold. It regulates the weight of seven tissues: blood, fat, muscles, bones, marrow, and reproductive tissues. In angina, ama builds up in the hirdayvahi channels, clogging them. The vata dosha is worsened by the blocking of cardiac passages. Vata is the element of air or wind. It is a dry, mobile, chilly substance that causes heart agony.[33]

Indian traditional medicinal system, as described in the Sushruta Samhita, recognized this situation in 600 BC, when the guru's pupils used to feel the diseased person's pulse and time their massage on the thighs and legs of the person for a long period of time to maximize venous return, similar to today's Enhanced external-counter pulsation technique. Ayurveda goes into great length about cardiovascular disease. Cardiovascular disorders are well discussed in the Charaksamhita and Sushrut Samhita, and they are classified as vataj, pitta, kaphaj, and krumij kinds. In Sushrut Samhita, the word dhamanipratichaya appears in the context of atherosclerosis. The reasons for coronary artery disease have been identified by Ayurvedic experts. Their main focus is on nutrition, anger, and emotions, which are the main causes of coronary artery disease.[34]

Symptoms of Hridroga in general include the following

वैवर्ण्यमय रायज्ञवरकासदहक्का

श्रवासास्यर्वैरस्यतषृाप्रमोहाः ।

र्दयः कपोत्कक्रेशरुजा अरुि

हृदरोगजाः स्युपर्वपयर्वधास्तथान्ये। सिस. ९/७८

These are the most common Hridroga symptoms.according to Charak Samhita These signs and symptoms can also be found in a varietyof cardiac conditions Pallor, cyanosis, and other symptoms Discoloration (vaivarnya) might include malar flush (kapolarunya), and Murchha (stupor) is the cardinal trait of Jwara (fever) is seen in septic endocarditis, Kasa (cough), Hikka, and jwara (fever) is seen in cardiac asthma. Shwasa (dyspnoea) is a pressure condition.Mitral regurgitation symptoms include It can be concluded from the foregoing

commonalities that Hridroga's description and its Various variants closely resemble today's heart disease, which is why the preventive measures are so important. Mitral stenosis requires both preventative and therapeutic interventions, according to Chhardi (vomiting),Aruchi (anorexia) can be detected in the coronary arteries.[35]

AYURVEDIC REMEDIES

Pushkar guggulu:- there are some s in Pushkar guggulu Guggulu from Pushkar; Guggulu from Pushkar has shown to be effective in the treatment of cardiac disease. Researchers discovered a significant reduction in blood cholesterol levels, as well as pericardial discomfort and dyspnoea during exertion, after six months of treatment with Pushkar guggulu.[35]

Arjuna:- enhances cardiac muscle function and, as a result, heart pumping activity. Terminalia's inotropic action is thought to be caused by sapo- nin glycosides, whereas flavonoids provide free radical antioxidant activity and vascular strengthening. Following a six-month therapy with Pushkar guggulu, researchers discovered that Serum lipid levels have significantly decreased. and, on exertion, pericardial discomfort and dyspnoea Arjuna.[35]

Hawthorn:- Crataegus, is a vast genus of shrubs and trees native to Europe, North America, and Asia. It includes various species such as Crataegus oxyacantha (in the West), Crataegus monogyna (common hawthorn), Crataegus laevigata, and Crataegus pinnatifida, among others (the Chinese herb shan zha). Hawthorn's leaves, flowers, and berries contain bioflavonoids that are thought to be responsible for its heart-healthy properties. C. oxyacantha's main cardioprotective action is ascribed to its oligomeric proanthocyanidin concentration in particular. Quercetin, quercetrin, triterpeeb saponins, vitamin C, and cardioactive amines are the primary active components. Angina pectoris, myocardial weakness, hypertension, tachycardia, arteriosclerosis, and Buerger's disease have all been treated with hawthorn berries in traditional herbal medicine. Several studies show that hawthorn extracts have cardiotonic benefits, such as boosting myocardial contraction force, improving coronary blood flow, improving oxygen usage by cardiomyocytes, and lengthening the refractory period and action-potential duration in heart and papillary muscles. According to studies, hawthorn increases coronary perfusion, has a modest hypotensive impact, and inhibits atherogenesis via having a negative chronotropic effect and a positive inotropic effect on cardiac myocyte contraction amplitude. In ischemia-reperfusion animal experiments, hawthorn was reported to minimise the incidence of reperfusion-induced

ventricular reduce mortality, and shorten the mean duration of arrhythmias. When rats given hawthorn extract were compared to controls, the area of myocardial infarction was much lower. Zapatero gives a summary of studies that looked into the different processes by which hawthorn could affect the cardiovascular system. In patients with dyspnoea, randomised controlled trials (RCTs) of the efficacy of hawthorn extract showed increased physical exercise capacity and decreased resting heart rate and mean diastolic blood pressure during exercise, as well as increased exercise capacity and cardiac performance in patients with cardiac failure. Other studies of hawthorn have shown improvements in symptoms associated with increasing the force of myocardial contraction, improving coronary blood flow, improving oxygen utilisation by cardiomyocytes, and prolonging the refractory period and action potential duration in heart and papillary muscles, according to Valli and Giardina18. According to studies, hawthorn increases coronary perfusion, has a modest hypotensive impact, and inhibits atherogenesis via having a negative chronotropic effect and a positive inotropic effect on cardiac myocyte contraction amplitude. In ischemia-reperfusion animal experiments, hawthorn was reported to minimise the incidence of reperfusion-induced ventricular fibrillations, reduce mortality,5 and shorten the mean duration of arrhythmias. When rats given hawthorn extract were compared to controls, the area of myocardial infarction was much lower. Zapatero gives a summary of studies that looked into the different processes by which hawthorn could affect the cardiovascular system. In patients with dyspnoea, randomised controlled trials (RCTs) of the efficacy of hawthorn extract showed increased physical exercise capacity and decreased resting heart rate and mean diastolic blood pressure during exercise, as well as increased exercise capacity and cardiac performance in patients with cardiac failure. Several other studies with hawthorn have shown improvement in symptoms related with heart failure (such as weariness) and measures of cardiac function, according to Valli and Giardina. Hawthorn extract imparts significant benefits as an additional treatment for chronic heart failure, according to meta-analyses, improving symptom control (such as shortness of breath and fatigue) and physiologic results.(maximal workload, exercise tolerance, cardiac oxygen consumption). When hawthorn and digitalis are used together, the latter's activity is significantly increased. In patients with mild heart failure, an observational cohort study found that the efficacy of a homoeopathic preparation of Cranolin (based on extracts of Crataegus and Spigelia anthelmia) was not inferior to that of commonly used ACE inhibitors or diuretics for 13 of the 15 variables used to assess efficacy. In a recent RCT, it was found that a hawthorn extract dose (1000 mg, 1500 mg, or 2000 mg) did not result in brachial artery flow dilation. The study concluded that if the berry extract

had a blood pressure-lowering impact, it was most likely due to a mechanism unrelated to nitric oxide. A research on the efficacy of a Camphor–Crataegus berry extract combination in the treatment of orthostatic hypotension found that it stabilised arterial pressure in orthostasis. However, the findings should be interpreted with caution because the placebo treatment consisted of 20 drops of a 60% alcohol solution, which is known to worsen orthostatic hypotension. In vitro tests show that hawthorn has an effect on ion channels in cardiac and smooth muscle cells, which, as Zapatero points out, could be the mechanism by which hawthorn can reduce ventricular arrhythmias, slow heart rate, and lower diastolic blood pressure. Hawthorn also appears to have antioxidant propertiesand can inhibit thromboxane A2 production in vitro.[36]

Herbo-mineral medication like Prabhakar vati alongside lekhana basti has strong antianginal and cardio defensive activities and it tends to be utilized successfully in the administration to slow down theprogress of pathogenesis of atherosclerosis leading to various coronary arterydiseases especially stable angina.[37]

Prabhakara Vati is an Ayurvedic herbal remedy that is used to treat cardiac disorders. Shuddha Shilajit, Abhrak Bhasma, Swarna Makshika Bhasma, Loha Bhasma, and Arjuna Swarasa are some of the elements that aid in heart health.[38]

Prabhakara Vati has a Hridya (cardiac tonic) quality, according to Ayurveda, which aids in strengthening the power of cardiac muscles and thus maintaining healthy heart function. Certain Ayurvedic elements in Prabhakara Vati help to balance Vata Dosha, which may aid in the management of high blood pressure. It also has Deepan (appetiser) and Pachan (digestive) characteristics, which help to flush out stored harmful cholesterol and keep blood cholesterol levels in control.[38][39]

Tinospora cordifolia has a dose-dependent cardioprotective effect against ischemia–reperfusion induced myocardial injury, which could be due to its free radical scavenging activity or indirectly by increasing endogenous antioxidant levels, protecting Mg2 dependent Ca2 ATPase enzyme, or antagonising free radical mediated inhibition of sarcolemma Na, K ATPase activity, or by Ca2 channel blocking activity.[34][41]

The ***Commiphora mukul*** tree is an Indian native. For ages, this tree has been utilised in Ayurvedic medicine, and documents dating back to 600 BC advocate it for the treatment of

atherosclerosis. Guggul gum resin is now used to treat arthritis, high cholesterol, atherosclerosis (hardening of the arteries), acne and other skin disorders, and weight loss.[42]

Garlic (Allium sativum L.) and its derivatives lower cardiovascular risk factors such as aberrant plasma lipids, oxidised low density lipoproteins (LDL), abnormal platelet aggregation, and high blood pressure. The critical preventative mechanism appears to be the stimulation of nitric oxide production in endothelial cells. Garlic's cytokine modulation in human blood may help to create an anti-inflammatory environment. Dietary garlic's cardioprotective benefits are largely mediated by hydrogen sulphide production. Erythrocytes convert organic polysulphides generated from garlic into hydrogen sulphide, which relaxes vascular smooth muscles, causes blood vessel dilation, and lowers blood pressure considerably.[43]

Atherosclerosis is a complex disease marked by an excessive inflammatory, fibro-fatty, proliferative response to arterial wall damage involving a variety of cell types, including smooth muscle cells, monocyte-derived macrophages, T-lymphocytes, and platelets. A key etiopathological factor in atherosclerosis is hyperlipidemia. Garlic's medical significance is most known for its cholesterol-lowering and anti-atherogenic properties.[29]

Fenugreek Seeds:- Fenugreek seeds have potent anti-inflammatory and antioxidant characteristics that help to avoid heart disease and chest pain. They accomplish this by increasing blood flow to the heart and lowering cholesterol levels.[44]

Basil:-This is chock-full of antioxidants. It has incredible anti-inflammatory qualities as well. Basil is recognised for lowering blood sugar and lowering LDL (bad) cholesterol. It can also help to keep your triglyceride levels in check. All of this helps to keep plaque from forming, which is the main cause of angina.[45]

Parsley is regarded as one of the most important home treatments for angina. It is available in the form of dried herbs or fresh leaves. Drinking parsley tea is also recommended since it has a pleasant taste and scent, as well as being excellent for treating angina.[46]

Parsley:- is an extremely nutrient-dense herb. Vitamin A, Vitamin C, Vitamin K, iron, and folic acid are all present. It also contains anti-oxidants, which aid in cell repair and boost the blood's ability to transport nutrients.[47]

Amala:- provides a long list of health advantages. It boosts the heart's pounding, which helps to stimulate blood flow.Vitamin C can also be beneficial in other ways. It has recently been discovered that eating foods high in vitamin C helps to keep the blood fluid, preventing it from clotting within the body. The entire obstruction of a constricted coronary artery by abrupt clotting in the blood within it frequently causes a heart attack (thrombosis). It prevents consuming excessive amounts of lipids derived from animals, which can help protect us against coronary thrombosis, heart attacks, and premature mortality.[48][49]

Cardiac Disorders and Panchakarma

Pizichil. Snehana (oleation) and swedana (sudation or sweat) therapies are combined in this very soothing process. A consistent stream of heated medicinal oil is softly poured over the body in a precise pattern, followed by a mild massage. This preliminary method involves covering the body in warm oil, which causes perspiration while also loosening the Ama (toxins). Following that, the person is covered with a cotton sheet or blanket and allowed to relax for a few minutes before taking a hot water bath. The scalp is subsequently treated with Rasnadi Churna, an ayurvedic concoction that balances the Vata and Kapha doshas. Pizichil is extremely useful in the treatment of coronary artery disease, hypertension, excessive blood pressure, and other cardiovascular diseases.[50]

Urovasthi

Urovasthi is a Sanskrit term that means The word Uro means chest, and the verb Vasthi means to contain or maintain something. As the name implies, this is a chest oil bath therapy. This treatment involves applying a specifically prepared warm medicinal oil or ghee to the chest for a set amount of time. Hrid vasthi is another name for the procedure, where Hrid refers to the heart. Ayurveda considers the heart to be one of the three major vital points (Marma) in the body. Because the therapy focuses primarily on revitalising and curing the heart, it is also known as Hridvasti, where 'Hrid' refers to the heart.[51][52]

CONCLUSION

This article defines the necessity for Ayurvedic Cardiology Management to be widely developed in the modern-day. In such circumstances, contemporary medicine's only option is surgical intervention. While in Ayurveda, a variety of medications are available to treat various cardiac problems, which aid in preventing, treating, and easing symptoms as well as protecting the valves from future damage. We can figure it out with a lot of practice. In this

case, Panchakarma is advised, Panchakarma will undoubtedly enhance the efficacy of conventional treatment, allowing us to shorten the duration of treatment to some extent.

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