Perimenopause and chest pain: When to suspect cardiac causes

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> Perimenopause presents a complex diagnostic challenge for clinicians, particularly when women report chest symptoms. The hormonal fluctuations characteristic of this life stage can induce a range of somatic complaints that frequently overlap with signs of cardiovascular disease, leading to diagnostic uncertainty and potential delays in appropriate care. Understanding the physiological changes during perimenopause is essential for accurate assessment and management.

KEY TAKEAWAYS

- The Pivot: Perimenopausal hormonal shifts can directly influence cardiovascular physiology, increasing the risk of misinterpreting chest symptoms.
- The Data: Estrogen withdrawal impacts endothelial function, lipid profiles, and vascular tone, contributing to atypical cardiac presentations.
- The Action: Thorough cardiac evaluation is paramount for perimenopausal women with new or worsening chest symptoms, even in the absence of traditional risk factors.

The perimenopausal transition, typically spanning several years before the final menstrual period, is marked by significant fluctuations in ovarian hormone production, primarily estrogen and progesterone. These hormonal shifts are not confined to reproductive tissues; they exert widespread effects across multiple organ systems, including the cardiovascular system. Estrogen, in particular, plays a protective role in maintaining vascular health, influencing endothelial function, lipid metabolism, and arterial elasticity. Its decline during perimenopause can therefore predispose women to changes that increase cardiovascular risk.

Women in perimenopause frequently report symptoms such as palpitations, chest discomfort, and dyspnoea, which can be highly distressing and mimic acute cardiac events. These symptoms often arise from a combination of factors, including vasomotor instability (hot flashes), anxiety, and direct cardiac effects of hormonal changes. The challenge for general practitioners and specialists lies in distinguishing these benign, hormonally-driven symptoms from genuine cardiac pathology, especially given that cardiovascular disease remains a leading cause of mortality in women.

The Cardiovascular Impact of Hormonal Shifts

Estrogen's influence on the cardiovascular system is broad. It promotes nitric oxide production, leading to vasodilation and improved endothelial function. It also has favourable effects on lipid profiles, increasing high-density lipoprotein (HDL) cholesterol and decreasing low-density lipoprotein (LDL) cholesterol. As estrogen levels decline during perimenopause, these protective mechanisms diminish. The result can be an increase in LDL cholesterol, a decrease

in HDL cholesterol, and a shift towards a more pro-inflammatory and pro-atherogenic state within the vasculature. This metabolic shift contributes to accelerated atherosclerosis and increased cardiovascular risk over time.

Beyond lipid changes, estrogen withdrawal can directly impact vascular tone and reactivity. Women may experience increased sympathetic nervous system activity, leading to episodes of tachycardia, palpitations, and elevated blood pressure. These physiological changes can manifest as chest discomfort or a sensation of a racing heart, often without underlying structural heart disease. The subjective experience of these symptoms can be intense, prompting urgent medical attention, even when the immediate cardiac workup is unremarkable. For a deeper understanding of heart failure treatment in 2026, clinicians might consult updated guidelines.

Differentiating Benign from Urgent Symptoms

When a perimenopausal woman presents with chest pain, a comprehensive clinical evaluation is essential. This must include a detailed history, focusing on the character, duration, and aggravating or alleviating factors of the pain, as well as associated symptoms like dyspnoea, diaphoresis, or radiation to the arm or jaw. It is important for patient safety to inquire about traditional cardiovascular risk factors, such as hypertension, diabetes, dyslipidaemia, smoking, and a family history of premature cardiovascular disease. The physical examination should include vital signs, cardiac auscultation, and assessment for signs of heart failure or other systemic conditions.

Electrocardiography (ECG) is a standard initial diagnostic tool. While a normal ECG does not rule out all cardiac pathology, it can help identify acute myocardial infarction, significant arrhythmias, or other electrical abnormalities. Cardiac biomarkers, such as troponin, are indispensable for ruling out acute coronary syndrome. Elevated troponin levels warrant immediate further investigation, regardless of the patient's menopausal status. The challenge arises when these initial tests are normal, but symptoms persist, leaving both patient and clinician in a diagnostic limbo. This is where a thorough understanding of perimenopausal physiology becomes important, as outlined in resources like the Oxford Handbook of Cardiology.

Stress testing, either exercise-based or pharmacological, can be considered for women with persistent chest pain and normal initial workup, particularly if there are multiple cardiovascular risk factors. Imaging modalities such as echocardiography can assess cardiac structure and function, identifying valvular disease, cardiomyopathy, or regional wall motion abnormalities. Coronary computed tomography angiography (CCTA) may be useful in selected cases to assess for coronary artery disease, especially in women with intermediate pre-test probability of disease. The decision to pursue these more advanced investigations should be guided by clinical suspicion and shared decision-making with the patient.

Atypical Presentations and Microvascular Dysfunction

Perimenopausal women are more prone to atypical presentations of coronary artery disease, often experiencing symptoms without classic exertional angina. They may report fatigue, sleep disturbances, or shortness of breath as primary complaints, making diagnosis more challenging. This phenomenon is partly attributed to a higher prevalence of microvascular dysfunction and non-obstructive coronary artery disease (MINOCA) in women. Microvascular dysfunction, where small coronary arteries do not dilate properly, can cause angina-like chest pain even in the absence of significant epicardial coronary artery stenosis. Hormonal changes are thought to contribute to this microvascular pathology.

The symptoms of microvascular angina can be particularly difficult to distinguish from perimenopausal symptoms. Both can be triggered by stress, emotional upset, or even temperature changes. The pain associated with microvascular dysfunction may be more diffuse, prolonged, and less responsive to nitrates compared to classic angina. Clinicians should maintain a high index of suspicion for microvascular dysfunction in perimenopausal women with persistent chest pain and normal epicardial coronary arteries on angiography. Further investigation may involve coronary flow reserve measurements or cardiac magnetic resonance imaging (CMR) to assess myocardial perfusion.

The Role of Hormone Replacement Therapy (HRT)

The role of hormone replacement therapy (HRT) in cardiovascular health remains a complex and debated topic. While earlier observational studies suggested a protective effect of HRT on cardiovascular disease, subsequent large-scale randomised controlled trials, such as the Women's Health Initiative (WHI), demonstrated a clearer picture. The WHI study, which has been extensively reviewed, indicated that the timing of HRT initiation relative to menopause onset significantly influences its cardiovascular effects. But for women initiating HRT many years after menopause, an increased risk of cardiovascular events was observed. For younger women initiating HRT closer to menopause, the risks appeared lower, and some benefits were noted, particularly for vasomotor symptoms and bone health. Our previous coverage on HRT and cancer risk provides additional context.

Current guidelines generally recommend HRT primarily for the management of bothersome menopausal symptoms, such as hot flashes and night sweats, rather than for primary prevention of cardiovascular disease. When considering HRT for perimenopausal women with chest symptoms, the decision must be individualised, weighing the potential benefits against the risks, including those related to cardiovascular events, venous thromboembolism, and breast cancer. A thorough discussion of these risks and benefits is essential, and alternative strategies for symptom management should also be considered. The 3M Littmann Classic III Stethoscope remains an essential tool for initial cardiac assessment.

Psychological Factors and Patient Reassurance

Anxiety and panic attacks are common during perimenopause and can manifest with symptoms strikingly similar to cardiac events, including chest pain, palpitations, and shortness of breath. The physiological changes of perimenopause, coupled with the psychological stress of this life transition, can exacerbate anxiety. It is important for clinicians to address these psychological factors as part of the overall management plan. Reassuring patients after a thorough cardiac workup has ruled out serious pathology is vital, but this reassurance must be delivered empathetically and with clear explanations of the benign nature of their symptoms.

But clinicians must also avoid prematurely attributing all chest symptoms to anxiety or perimenopause without a complete cardiac evaluation. The risk of missing genuine cardiovascular disease is too high. A balanced approach involves comprehensive investigation to rule out serious pathology, followed by appropriate management of perimenopausal symptoms and psychological support if indicated. This dual approach ensures patient safety while addressing the holistic needs of women during this transitional phase. The diagnostic process can be complex, and a good phenotyping of heart failure, for example, is critical.

The diagnostic challenge of chest symptoms in perimenopausal women highlights the need for vigilance and a systematic approach. While many symptoms may be hormonally mediated, the potential for underlying cardiovascular disease necessitates careful exclusion of cardiac pathology. Clinicians must be adept at navigating this diagnostic ambiguity,

ensuring that women receive both appropriate cardiac care and effective management of their perimenopausal symptoms. The ongoing research into sex-specific differences in cardiovascular disease continues to refine our understanding and improve patient outcomes.

CLINICAL IMPLICATIONS

The overlap between perimenopausal symptoms and cardiac presentations is a persistent diagnostic trap. Clinicians must resist the urge to dismiss chest pain in this demographic as merely 'hormonal' without a rigorous cardiac workup. The consequences of missing early cardiovascular disease are far too severe.

The decline in estrogen fundamentally alters cardiovascular physiology, increasing risk factors and potentially masking typical angina patterns. This means that a normal ECG and troponin do not always provide full reassurance, especially in women with multiple traditional risk factors or atypical symptoms. Further investigation, including stress testing or advanced imaging, should be considered based on clinical suspicion.

For industry, this highlights an unmet need for better diagnostic tools that can differentiate hormonally-mediated symptoms from early-stage cardiovascular disease in women. Current diagnostic algorithms are often biased towards male presentations. Developing sex-specific biomarkers or imaging protocols could significantly improve outcomes.

Patients need clear communication and thorough evaluation. Reassurance is only effective when it is earned through comprehensive testing. Failing to investigate adequately risks eroding trust and, more importantly, delaying critical interventions for genuine cardiac pathology.

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