

RESEARCH ARTICLE

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Biochemical and histological profiles of gallstones in pre- and postmenopausal women

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Abstract

Objective: Cholesterol gallstones are frequently observed in postmenopausal women due to hormonal and metabolic alterations. Objective: To study differences in biochemical and histological gallbladder profiles between pre- and postmenopausal women with cholesterol gallstones.

Methods: A total of 100 patients with gallstones and 80 healthy controls. Inflammatory markers (CRP, IL-6, MDA), liver enzymes, lipids, and bilirubin were measured. Stone composition and gallbladder histology were examined.

Results: CRP, IL-6 and MDA were significantly increased in patients with gallstones compared to controls. IL-6 levels were increased in postmenopausal women, whereas MDA was higher in premenopausal patients. Serum total cholesterol and triglyceride levels were higher in postmenopausal patients. AST and ALT were raised in both groups. Magnesium levels were increased in postmenopausal gallstone patients, whereas no significant differences were found in the calcium, sodium, and potassium contents of the stones. Histology revealed severe inflammatory infiltration, RAS, mucosal hyperplasia, haemorrhage and muscular hypertrophy in chronic cholecystitis. Subepithelial foamy lipocytes, ulceration of the mucosa, vascular congestion, haemorrhage, thrombosis, and necrosis characterise acute cholecystitis. hypertrophic muscle bundles were commonly contiguous with these structures. The wall of gallbladders with cholesterol stones demonstrated a focal destruction of muscle fibres, congestion, widespread necrosis and an invasion by neutrophils and vacuolated cells.

Conclusion: Menopausal status strongly affects the biochemical and histopathological profiles of cholecystitis disease, with postmenopausal patients demonstrating greater metabolic and inflammatory disturbances, highlighting the importance of age- and hormone-specific approaches in diagnosis and management.

Keywords: Gallbladder, malondialdehyde, hyperplasia, chronic inflammation, Postmenopausal

Plain English Summary

Gallstones are solid concretions that form in the gallbladder and can cause pain, infection, and damage to gallbladder tissues. They are more common in women after the menopause stage due to loss of estrogen and metabolic changes. In the present study, we compared 100 women with cholesterol gallstones (pre- and postmenopausal) to 80 healthy women without gallstones. We recorded blood markers of inflammation, oxidative damage, liver function, and cholesterol, analysed the stones' chemical composition and the gallbladders' microscopic structure. Our results showed that women with gallstones had higher values of inflammation and oxidative stress markers in their blood compared to healthy women. Postmenopausal women had a higher degree of inflammatory activity, and premenopausal women had a greater level of oxidative stress. The levels of cholesterol and triglyceride were higher in the postmenopausal women, and this was reflected in the composition of the stones. The gallbladder tissue of patients was found to have heavy inflammation, damage to and thickening of tissue, damage to muscle fibres, and, in some cases, death of cells. These findings indicate that

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