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GALLSTONE DISEASE AND ITS COMPLICATIONS AMONG LAW ENFORCEMENT OFFICERS AND THEIR FAMILY MEMBERS: PREVALENCE, TREATMENT STRATEGIES, AND APPROACHES TO COMPLICATION PREVENTION

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Abstract

Gallstone disease (GSD) remains one of the most prevalent gastrointestinal disorders worldwide and represents a significant healthcare burden. Occupational factors such as chronic stress, irregular nutrition, night shifts, and sedentary lifestyle may increase the risk of gallstone formation among law enforcement officers. The present study aimed to assess the prevalence of gallstone disease among employees of internal affairs bodies and their family members, evaluate modern treatment approaches, and identify effective preventive measures against disease complications. A retrospective analysis of medical records and clinical outcomes was conducted. The findings indicate a high prevalence of gallstone disease in individuals exposed to occupational stress factors. Early diagnosis, laparoscopic surgical treatment, and lifestyle modification significantly reduce the incidence of severe complications.

Keywords: gallstone disease, cholelithiasis, cholecystitis, law enforcement officers, prevention, laparoscopic cholecystectomy, complications.

Introduction

Gallstone disease is one of the most common disorders of the hepatobiliary system and is characterized by the formation of calculi within the gallbladder and biliary tract. According to international epidemiological studies, the prevalence of gallstone disease ranges from 10% to 20% among adults and continues to increase globally due to changing lifestyles, obesity, metabolic disorders, and aging populations.

The relevance of gallstone disease among law enforcement personnel is associated with specific occupational characteristics. Employees of internal affairs bodies frequently experience irregular working schedules, prolonged psychological stress, insufficient physical activity, and unhealthy dietary habits. These factors contribute to disturbances in lipid metabolism and bile composition, thereby increasing the risk of gallstone formation.

Furthermore, family members of law enforcement officers may also be affected due to shared lifestyle patterns and hereditary predisposition. The prevention of disease progression and complications remains a priority task for healthcare systems serving these populations.

The aim of the study was to investigate the prevalence of gallstone disease among law enforcement officers and their family members, analyze clinical outcomes, and evaluate modern therapeutic and preventive strategies.

Materials and Methods

A retrospective observational study was conducted using medical records obtained from departmental healthcare institutions serving employees of internal affairs bodies and their families between 2021 and 2025.

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Study Population

A total of 312 individuals diagnosed with gallstone disease were included in the study. Participants were divided into two groups:

- Group 1: Law enforcement officers (n = 182)
- Group 2: Family members (n = 130)

Inclusion Criteria

- Age above 18 years;
- Confirmed diagnosis of gallstone disease;
- Availability of complete medical documentation;
- Informed consent for participation.

Diagnostic Methods

The following methods were used:

- Clinical examination;
- Ultrasonography of abdominal organs;
- Biochemical blood analysis;
- Magnetic resonance cholangiopancreatography (MRCP);
- Computed tomography when indicated.

Statistical Analysis

Statistical processing was performed using SPSS software version 26. Quantitative variables were expressed as mean ± standard deviation. Differences between groups were evaluated using Student's t-test and Chi-square test. Statistical significance was accepted at $p < 0.05$.

Results

The average age of participants was 47.6 ± 8.3 years.

Table 1. Distribution of Patients by Gender

Gender	Number	Percentage (%)
Male	128	41.0
Female	184	59.0
Total	312	100

Women demonstrated a significantly higher prevalence of gallstone disease compared with men ($p < 0.05$).

Table 2. Main Risk Factors Identified

Risk Factor	Frequency (%)
Obesity	42.6
Sedentary lifestyle	38.1
Chronic stress	67.3
Hyperlipidemia	35.4
Diabetes mellitus	21.2
Family history	29.8

Chronic occupational stress was the most frequently identified risk factor among law enforcement officers.

Figure 1. Frequency of Major Complications

Acute calculous cholecystitis – 45%
Choledocholithiasis – 23%
Acute biliary pancreatitis – 17%

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Gallbladder empyema – 9%

Perforation and peritonitis – 6%

Acute calculous cholecystitis was the most common complication observed during the study period.

Surgical Outcomes

Among the studied patients:

- Laparoscopic cholecystectomy was performed in 241 patients (77.2%);
- Open surgery was required in 32 patients (10.3%);
- Conservative treatment was applied in 39 patients (12.5%).

The postoperative complication rate following laparoscopic surgery was only 3.7%, significantly lower than after open surgical interventions.

Discussion

The present findings confirm that gallstone disease remains highly prevalent among law enforcement officers and their family members. The identified prevalence exceeds average population rates reported in several international studies.

The elevated incidence can be explained by occupational exposure to chronic stress, irregular eating schedules, insufficient physical activity, and sleep disturbances. Similar observations have been reported by the European Association for the Study of the Liver and the World Gastroenterology Organisation.

Stress contributes to autonomic dysfunction and disturbances in gallbladder motility, resulting in bile stasis and increased lithogenicity. In addition, metabolic syndrome and obesity significantly enhance cholesterol supersaturation of bile.

Ultrasonography remains the first-line diagnostic modality due to its accessibility, non-invasive nature, and high sensitivity. MRCP and ERCP provide additional diagnostic value in complicated cases involving bile duct obstruction.

Laparoscopic cholecystectomy continues to be the gold standard treatment for symptomatic gallstone disease. The procedure is associated with shorter hospitalization, lower postoperative pain, faster recovery, and fewer complications compared with conventional surgery.

Preventive measures should focus on reducing modifiable risk factors. Workplace health promotion programs, dietary counseling, stress management strategies, and regular medical screening may substantially reduce disease burden among law enforcement personnel.

Practical Recommendations

To reduce the incidence and complications of gallstone disease among employees of internal affairs bodies, the following measures are recommended:

1. Annual ultrasonographic screening for high-risk individuals.
2. Implementation of workplace wellness programs.
3. Dietary modification with reduced saturated fat intake.
4. Promotion of regular physical activity.
5. Weight management programs.
6. Early referral for surgical consultation in symptomatic patients.
7. Stress reduction interventions and psychological support services.

Conclusion

Gallstone disease is a common chronic disorder that significantly affects the health and quality of life of law enforcement officers and their family members. Occupational stress, sedentary lifestyle, and metabolic disturbances play a substantial role in disease development. Early diagnosis through routine screening, timely surgical treatment, and comprehensive preventive measures can significantly

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reduce the frequency of severe complications. Healthcare systems serving law enforcement personnel should prioritize preventive programs and regular medical examinations to improve long-term outcomes.

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