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"Clinical Profile and Laboratory Findings of Patients with Periampullary Carcinoma"

*Dr. Sadia Bente Kabir[1], Dr. Walid Ali Khan[2], Dr. Sharif Jayad Atique[3], Dr. Amit Karmaker[4], Dr. Dulan Roy[5], Dr. Tahsin Firoza Khan[6]

[1]*Specialist, Department of General Surgery, Square Hospital Ltd, Dhaka, Bangladesh*
[2]*Medical Officer, Department of Casualty, Accident and Emergency, Labaid Cardiac Hospital, Dhaka, Bangladesh*
[3]*Assistant Registrar, Department of Surgery, Faridpur Medical College Hospital, Dhaka, Bangladesh*
[4]*Registrar, Department of General Surgery, Square Hospital Ltd, Dhaka, Bangladesh*
[5]*Clinical Staff, Department of General Surgery, Square Hospital Ltd, Dhaka, Bangladesh*
[6]*Specialist, Department of Vascular Surgery, York & Scarborough Teaching Hospitals NHS Foundation Trust, Dhaka, Bangladesh*
Corresponding Author: Dr. Sadia Bente Kabir, Specialist, Department of Surgery, Square Hospital Ltd, Dhaka, Bangladesh

Abstract
Background: *Obstructive jaundice is one of the most common causes of patient admission in surgery department. Although incidence of periampullary carcinoma is rare, early and accurate diagnosis is essential for timely treatment and improved outcome.*
Objective: *To evaluate the clinical profile and laboratory findings of patients with periampullary carcinoma admitted to a tertiary care hospital.*
Methods: *This prospective study was conducted in the Department of Surgery, Shaheed Suhrawardy Medical College & Hospital, from March 2022 to September 2022. A total of 50 adult patients with obstructive jaundice and histopathologically confirmed periampullary carcinoma were included. Data regarding demographic profile, clinical presentation, examination findings, and laboratory investigations were collected from hospital records and analyzed using SPSS version 24.*
Results: *The mean age of the patients was 48.26±14.88 years, with most patients belonging to the 31–50 years age group (48%). Male predominance was observed (58%). Jaundice was present in all patients (100%). Other common symptoms were weight loss (92%), steatorrhea (78%), epigastric pain (44%), abdominal lump (40%), and malaena (26%). Diabetes mellitus was the most frequent co-morbidity (48%), followed by hypertension (32%). Anaemia was observed in 72% and abdominal tenderness in 86% of patients. Most patients had serum bilirubin levels between 10–20 mg/dL (46%). Raised alkaline phosphatase was found in 88%, elevated CA 19-9 in 74%, and raised CEA in 26% of patients.*
Conclusion: *Periampullary carcinoma commonly presented with jaundice, weight loss, and cholestatic biochemical abnormalities. Early recognition of these findings may help prompt diagnosis and management.*
Key words: *Periampullary carcinoma, obstructive jaundice, clinical profile, laboratory findings, CA 19-9.*

I. Introduction

Periampullary carcinoma is a heterogeneous group of malignant tumors arising within 2 cm of the ampulla of Vater, including tumors originating from the pancreatic head, distal common bile duct, ampulla, and adjacent duodenum.[1] These neoplasms are clinically important because they frequently present earlier than pancreatic adenocarcinoma due to biliary obstruction, thereby offering a greater opportunity for curative surgical resection.[1,2] Although periampullary carcinoma accounts for a relatively small proportion of gastrointestinal malignancies, it contributes substantially to morbidity and mortality associated with hepatopancreatobiliary cancers.1 The incidence has gradually increased over recent decades, likely due to improved diagnostic imaging, increasing life expectancy, and better recognition of ampullary and periampullary lesions.[2]

Obstructive jaundice is one of the most common presenting manifestations of periampullary carcinoma.[3] It develops when bile flow from the liver to the duodenum is impaired, resulting in the accumulation of conjugated bilirubin in the bloodstream.[3,4] Patients usually present with progressive jaundice, dark urine, pale stool, generalized itching, anorexia, weight loss, abdominal discomfort, and occasionally cholangitis.[1,3] Because jaundice often appears early in periampullary tumors, these cancers may be diagnosed at a more operable stage compared with pancreatic body or tail malignancies.[5] Early diagnosis is therefore essential, as complete surgical excision remains the only potentially curative treatment and significantly improves long-term survival.[5]

Clinical assessment combined with laboratory evaluation provides the first clue to diagnosis. Liver function tests commonly reveal a cholestatic pattern with elevated serum bilirubin, alkaline phosphatase, gamma-glutamyl transferase, and varying degrees of transaminase elevation.[4] Serum albumin may be reduced in advanced disease or malnutrition. Hematological abnormalities such as anemia and inflammatory markers may also be present.[6] Tumor markers, including carbohydrate antigen 19-9 (CA 19-9) and carcinoembryonic antigen (CEA), are frequently used adjuncts in the evaluation of suspected periampullary malignancy.[7] However, these markers lack sufficient sensitivity and specificity, especially in the presence of cholestasis or benign inflammatory disease, and therefore cannot replace tissue diagnosis.[7]

Imaging plays a central role in the diagnosis, staging, and treatment planning of periampullary carcinoma. Ultrasonography (USG) is usually the initial imaging modality because it is widely available, inexpensive, noninvasive, and effective for detecting biliary dilatation.3,4 It may also identify gallstones, hepatic metastases, or gross pancreatic masses. However, visualization of the distal common bile duct and ampullary region is often limited by bowel gas, obesity, and operator dependency.[5]

Computed tomography (CT) scan is more accurate than ultrasonography in defining the level and likely cause of obstruction and is valuable for evaluating local extension, vascular invasion, lymphadenopathy, and distant metastasis.[4,6] Multidetector CT has become an important preoperative tool for resectability assessment. Nevertheless, small ampullary lesions and early mucosal tumors may be missed, and radiation exposure remains a concern.[6]

Magnetic resonance cholangiopancreatography (MRCP) is a highly useful noninvasive modality that provides detailed images of the biliary and pancreatic ductal systems without ionizing radiation or contrast injection.[8] Advances in MRI technology have improved spatial resolution and shortened scan time, making MRCP particularly valuable in patients with obstructive jaundice.[8,9] It can accurately determine the level of obstruction, detect periampullary masses, and guide further management decisions.

Endoscopic retrograde cholangiopancreatography (ERCP), once primarily diagnostic, is now more commonly reserved for therapeutic interventions such as biliary drainage, stent placement, sphincterotomy, brush cytology, and biopsy.[10] Although ERCP provides direct visualization and tissue sampling, it is invasive and associated with complications including pancreatitis, bleeding, cholangitis, and perforation.[10,11] Endoscopic ultrasonography (EUS) also has an emerging role in detecting small lesions and obtaining fine needle aspiration specimens.[12]

Despite advances in imaging and biomarkers, histopathological examination remains the gold standard for definitive diagnosis of periampullary carcinoma.[1] Tissue can be obtained endoscopically during ERCP or EUS-guided procedures, or after surgical resection.[11] Accurate preoperative diagnosis is essential to avoid unnecessary surgery, optimize patient selection, and plan appropriate oncological management.[13]

Understanding the clinical presentation and laboratory abnormalities of periampullary carcinoma is important for early suspicion and timely referral. In resource-limited settings, where advanced imaging may not always be readily available, recognition of characteristic clinical and biochemical profiles can significantly improve diagnostic pathways. Therefore, this study aims to evaluate the clinical profile and laboratory findings of patients with periampullary carcinoma and contribute to improved early diagnosis and management strategies.

Objectives

The main objective was to assess the clinical profile and laboratory findings of patients with periampullary carcinoma presenting to a tertiary care hospital.

II. Methodology & Materials

The prospective study was conducted in the Department of Surgery, Shaheed Suhrawardy Medical College & Hospital, Dhaka, Bangladesh. The study was carried out over twelve months from March 2022 to September 2022. The study population consisted of patients admitted with obstructive jaundice and clinical suspicion of malignancy who were subsequently diagnosed as periampullary carcinoma on histopathological examination.

A total of 50 patients were enrolled purposively according to the predefined inclusion and exclusion criteria. Adult patients aged more than 18 years with obstructive jaundice and histopathologically confirmed periampullary patients who were willing to participate in the study were included. Patients who refused consent, had contraindications to undergo magnetic resonance imaging (MRI), had pre-hepatic or hepatic jaundice, or had psychiatric illness interfering with participation were excluded from the study. Before commencement of the study, formal ethical approval was obtained from the Ethical Review Committee of Shaheed Suhrawardy Medical College. Written informed consent was taken from each respondent after explaining the nature, purpose, and procedure of the study, along with their right to withdraw from participation at any stage without any consequence. Confidentiality of all participants and collected information was strictly maintained. Data were collected from hospital records, clinical files, and patient interviews using a structured case record form. Demographic variables

such as age, sex, residence, occupation, and relevant risk factors were recorded. Detailed clinical information including jaundice, abdominal pain, fever, weight loss, pruritus, anorexia, pale stool, dark urine, vomiting, and duration of symptoms were documented. Physical examination findings such as pallor, icterus, hepatomegaly, palpable gallbladder, abdominal mass, ascites, and nutritional status were also noted. Relevant laboratory investigations were reviewed, including complete blood count, serum bilirubin (total and direct), alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, serum albumin, prothrombin time, renal function tests, blood glucose, and serum electrolytes. Tumor markers such as CA 19-9 and carcinoembryonic antigen (CEA) were included where available. Imaging findings from ultrasonography, computed tomography (CT), magnetic resonance cholangiopancreatography (MRCP), endoscopic retrograde cholangiopancreatography (ERCP), and other relevant modalities were also recorded.

Statistical Analysis: All data were recorded systematically in preformed data collection form and quantitative data was expressed as mean and standard deviation and qualitative data was expressed as frequency distribution and percentage. Statistical analysis was carried out by using Statistical analysis was done by using SPSS (Statistical Package for Social Science) Version 24. Categorical variables were presented as frequency and percentage and compared using Chi-square test. Continuous variables were expressed as mean ± standard deviation or median where appropriate and analyzed using Student's t-test or relevant nonparametric tests. A p-value of <0.05 was considered statistically significant.

III. Result

Table 1: Demographic Characteristics of the Study Population (n=50)

Variables		Frequency	Percentage (%)
Age group (years)	≤30	7	14
	31–50	24	48
	51–70	15	30
	>70	4	8
Mean ± SD		48.26 ± 14.88	
Gender	Male		
	Female	29	58
Marital status	Unmarried	5	10
	Married	38	76
	Others	7	14
Occupation	Service holder	10	20.0
	Businessman	4	8.0
	Housewife	19	38.0
	Unemployed	3	6.0
	Others	14	28.0
Socioeconomic status	Upper class	0	0
	Middle class	19	38.0
	Lower class	31	62.0

Table 1 shows the demographic characteristics of the study population. The mean age of the respondents was 48.26±14.88 years, and the highest proportion of patients belonged to the 31–50 years age group (48%), followed by 51–70 years (30%). Male patients were predominant (58%), and most respondents were married (76%). Housewife was the most common occupation (38%), while the majority of the patients belonged to the lower socioeconomic class (62%).

Table 2: Clinical Presentation of the Patients (n=50)

Clinical Presentation	Frequency	Percentage (%)
Jaundice	50	100
Weight loss	46	92
Steatorrhea	39	78
Epigastric pain	22	44
Abdominal lump	20	40
Malaena	13	26

Table 2 demonstrates the clinical presentation of the patients. All respondents presented with jaundice (100%). Other common presenting symptoms were weight loss (92%), steatorrhea (78%), epigastric pain (44%), abdominal lump (40%), and malaena (26%).

Figure 1: Co-morbidities of the Patients (n=50)

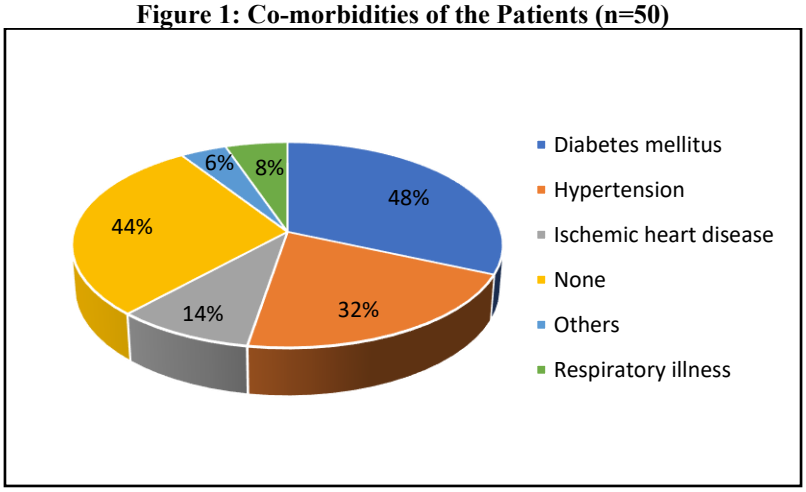

Figure 1 illustrates the co-morbid conditions of the study subjects. Diabetes mellitus was the most common co-morbidity (48%), followed by hypertension (32%), ischemic heart disease (14%), respiratory illness (8%), and other illnesses (6%). However, 44% of the respondents had no associated co-morbidity.

Table 3: Physical Examination Findings (n=50)

Findings	Frequency	Percentage (%)
General Examination		
Anaemia	36	72
Jaundice	50	100
Oedema	12	24
Dehydration	18	36
Itch mark	25	50
Abdominal Examination		
Abdominal tenderness	43	86
Abdominal lump	24	48
Ascites	17	34
Hepatomegaly	11	22
Palpable gallbladder	10	20

Table 3 presents the physical examination findings of the patients. On general examination, jaundice was found in all cases (100%), followed by anaemia (72%), itch marks (50%), dehydration (36%), and oedema (24%). On abdominal examination, tenderness was the most frequent finding (86%), followed by abdominal lump (48%), ascites (34%), hepatomegaly (22%), and palpable gallbladder (20%).

Table 4: Laboratory Findings of the Patients (n=50)

Investigation	Frequency	Percentage (%)
Serum Bilirubin		
<10 mg/dL	20	40
10–20 mg/dL	23	46
>20 mg/dL	7	14
Serum Alkaline Phosphatase		
Normal	6	12
Raised	44	88
CA 19-9		
Normal	13	26
Raised	37	74
CEA		
Normal	37	74
Raised	13	26

Table 4 shows the laboratory findings of the study population. Most patients had serum bilirubin levels between 10–20 mg/dL (46%), while 40% had levels below 10 mg/dL and 14% had levels above 20 mg/dL. Raised serum alkaline phosphatase was observed in 88% of respondents. CA 19-9 was elevated in 74% of patients, whereas raised CEA was found in 26% of cases.

IV. Discussion

Periampullary carcinoma is an important malignant cause of obstructive jaundice and remains a common indication for admission in surgical wards. It usually presents earlier than many other pancreaticobiliary malignancies because biliary obstruction develops at an early stage.[3,4] Early diagnosis is essential, as timely surgical resection offers the best chance of cure and improved long-term survival.[5] The present study evaluated the clinical profile and laboratory findings of patients with periampullary carcinoma admitted to a tertiary care hospital. In this study, the mean age of the respondents was 48.26±14.88 years (range 21–80 years), and the majority of patients (48%) were within 31–50 years of age. Male predominance was observed (58%). Similar findings were reported by Anand R et al, where patients were between 21 to 86 years of age.[6] Hina Hanif et al also reported a mean age of 54.73±12.65 years with almost equal sex distribution.[3] The relatively younger age group in the present study may reflect demographic variation, earlier exposure to risk factors, or differences in healthcare-seeking behavior. Socio-demographic findings showed that most respondents were married (76%), housewives constituted the largest occupational group (38%), and the majority came from lower socioeconomic status (62%). These findings may indicate delayed access to healthcare facilities and late presentation among economically disadvantaged populations. All respondents in the present study presented with jaundice (100%), which confirms that obstructive jaundice is the most common presenting feature of periampullary carcinoma. Other frequent symptoms were weight loss (92%), steatorrhea (78%), epigastric pain (44%), abdominal lump (40%), and malaena (26%). These findings are consistent with previous reports where jaundice, weight loss, abdominal pain, anorexia, and altered bowel habits were common symptoms in periampullary malignancy.[3-5,12] Weight loss in a high proportion of cases may suggest advanced disease at presentation. Majority of the respondents had diabetes mellitus (48%) as co-morbidity, followed by hypertension (32%), ischemic heart disease (14%), respiratory illness (8%), and others (6%), while 44% had no associated co-morbidity. A systematic review demonstrated that diabetes mellitus is associated with an increased risk of pancreatic and periampullary malignancy, which supports the high frequency of diabetes observed in this study.[14] On general examination, jaundice was present in all patients (100%). Other findings included anaemia (72%), oedema (24%), dehydration (36%), and itch marks (50%). Most respondents had abdominal tenderness (86%), while 48% had abdominal lump, 34% had ascites, 22% had hepatomegaly, and 20% had palpable gallbladder. These findings indicate that many patients presented with prolonged biliary obstruction, malnutrition, and locally advanced disease. Regarding laboratory profile, most respondents had serum bilirubin within 10–20 mg/dL (46%), followed by below 10 mg/dL (40%) and above 20 mg/dL (14%). None had normal bilirubin levels. Raised serum alkaline phosphatase was found in 88% of patients, reflecting cholestatic obstruction. CA 19-9 was elevated in 74% of patients, whereas CEA was raised in 26% of cases. These findings are similar to previous studies where CA 19-9 was the most commonly elevated tumor marker in periampullary and pancreaticobiliary malignancies.[9] Kim et al reported that serum CA 19-9 is a useful adjunct marker in periampullary cancers, although levels may also rise in benign biliary obstruction.[15] The high frequency of jaundice, elevated bilirubin, raised alkaline phosphatase, and increased CA 19-9 in the present study emphasizes the importance of combined clinical and laboratory assessment in suspected periampullary carcinoma. Recent evidence also suggests that combining bilirubin level, alkaline phosphatase, and CA 19-9 may improve early suspicion of malignant biliary obstruction before definitive imaging.[16] Overall, the findings of the present study are broadly comparable with previously published literature. Patients commonly presented with jaundice, weight loss, biochemical cholestasis, and elevated tumor markers. Recognition of these clinical and laboratory patterns can facilitate earlier diagnosis, prompt referral, and timely management of periampullary carcinoma.

V. Limitations of the study

This study was conducted in a single tertiary care hospital with a relatively small sample size, which may limit the generalizability of the findings to the wider population. The retrospective cross-sectional design depended partly on available hospital records, so incomplete documentation may have influenced some variables. Histopathological confirmation was not uniformly available before intervention in all cases, and some laboratory markers were not performed in every patient due to resource limitations. In addition, long-term outcomes after treatment could not be assessed because follow-up data were not included in this study.

VI. Conclusion

Periampullary carcinoma commonly presented in middle-aged to older adults, with male predominance, and obstructive jaundice was the universal presenting feature. Weight loss, steatorrhea, abdominal pain, and abdominal lump were also frequent clinical manifestations. Most patients showed cholestatic laboratory abnormalities with elevated serum bilirubin, raised alkaline phosphatase, and increased CA 19-9 levels. Diabetes mellitus was the most common associated co-morbidity. Recognition of these characteristic clinical profiles and laboratory findings can facilitate early suspicion, prompt diagnosis, and timely referral for definitive management of periampullary carcinoma.

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Ethical approval: The study was approved by the Institutional Ethics Committee.

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