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Article

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Authors: Edras Samuel Hernández Musús, Julia Milagro Ovalle Quiñonez, Allan Antonio Vargas Escobar, Rixci Augusto Ramírez Fallas

Corresponding Author: Edras Samuel Hernández Musús

Affiliation: Instituto Guatemalteco de Seguridad Social, Hospital General de Enfermedades, Universidad de San Carlos de Guatemala

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ABSTRACT

Background: Pancreatic cancer is one of the most lethal malignancies worldwide, with scarce epidemiological data in Guatemala. Patients frequently experience delayed diagnosis, limited access to oncologic therapies, and socioeconomic barriers that worsen outcomes.

Methodology: A retrospective descriptive study was conducted at the Hospital General de Enfermedades, IGSS, between January 2024 and September 2025. Adult patients (≥ 18 years) with histologically confirmed pancreatic cancer were included. Demographic, clinical, pathological, therapeutic, and socioeconomic variables were described using descriptive statistics.

Results: Twenty patients were included, with a mean age of 57 ± 20.2 years. Sixty-five percent lived in urban areas, and 35% in rural regions. The most frequent comorbidities were diabetes mellitus (35%) and hypertension (30%). Ab-

dominal pain was the predominant symptom (90%), followed by weight loss (45%) and jaundice (25%). Half of the patients were diagnosed at stage IV, with the liver as the most common metastatic site (30%). Ductal adenocarcinoma accounted for 70% of histological diagnoses. Forty percent underwent surgery, 25% received chemotherapy, and 50% were managed with palliative or supportive care.

Conclusion: Pancreatic cancer in Guatemala is characterized by late-stage diagnosis, limited access to specialized treatment, and high mortality. These findings underscore the urgent need for early detection, improved therapeutic access, and systematic integration of palliative care within the national health system.

Keywords: Pancreatic Neoplasms; Survival; Socioeconomic Factors; Palliative Care

INTRODUCTION

Pancreatic cancer is one of the most aggressive and lethal malignancies in clinical practice, representing the seventh leading cause of cancer death worldwide. Its 5-year survival rate remains below 10%, mainly due to diagnosis at advanced stages and the limited efficacy of available treatments ^{1,2,3}.

In Guatemala, the first published data come from a retrospective descriptive study conducted at the National Cancer Institute (INCAN) between 1988 and 1999, which reported 53 new cases over 12 years (≈ 4.4 cases per year). That study described a predominance in women, higher frequency between 51 and 60 years, and associations with diabetes mellitus, previous cholecystectomy, and family history of cancer ⁴.

More recently, it has been highlighted that although pancreatic cancer is not among the most frequent tumors, it is one of the deadliest due to late diagnosis, absence of early symptoms, and limited access to diagnostic technologies in rural areas. At IGSS, between 2019 and 2024, 350 cases and 321 deaths were reported, reflecting its high lethality and the urgent need to strengthen prevention, early detection, and access to specialized oncologic therapies. The substantial discrepancy between the 53 cases reported over 12 years at INCAN and the 350 cases captured in only 5 years at IGSS likely reflects improved diagnostic capacity, expansion of the institutional catchment area, and enhanced reporting mechanisms. This contrast underscores the need for a structured and standardized national data collection system for pancreatic cancer ^{4,5}.

In Latin America, most cases are diagnosed at advanced stages due to the lack of screening programs and limited availability of technologies such as endoscopic ultrasound or MRI ^{6,7}. Consequently, most patients only receive palliative treatment with gemcitabine or FOLFIRINOX, while curative surgery remains accessible to very few. In contrast, high-income countries benefit from high-volume surgical centers, adjuvant therapies, and innovative treatments, including immunotherapy and targeted therapies for molecular subgroups ^{8,9,10,11}. Evidence from adjuvant trials such as PRODIGE 24 has demonstrated that modified FOLFIRINOX significantly improves survival after curative surgery, with median overall survival exceeding 50 months in selected populations ^{11,12,13}.

This study aims to describe the clinical, pathological, therapeutic, and survival characteristics of a cohort of pancreatic cancer patients treated at IGSS, emphasizing socioeconomic challenges and the role of palliative care in the Guatemalan context. In the IGSS setting, a key challenge

is that most patients present with advanced-stage disease, making palliative treatment predominant therapeutic pathway. This situation does not reflect a lack of therapeutic options but rather the late stage at diagnosis. The high proportion of patients requiring immediate palliative management highlights the need for stronger early integration of palliative care into routine clinical practice ^{4,5}.

METHODOLOGY

This was a retrospective descriptive study conducted at the Hospital General de Enfermedades, Instituto Guatemalteco de Seguridad Social (IGSS), a tertiary referral center located in Guatemala City, from January 2024 to September 2025. Adult patients aged 18 years or older with histologically confirmed pancreatic cancer were included. Data were obtained from institutional medical records and pathology reports. The variables analyzed included demographic characteristics (age, sex, and geographic origin), clinical data (comorbidities such as diabetes mellitus, hypertension, or chronic kidney disease; presenting symptoms; and clinical stage at diagnosis according to the AJCC classification), pathological features (tumor site and histological subtype), and therapeutic modalities (surgery, chemotherapy, radiotherapy, or palliative/supportive care). The information was analyzed using descriptive statistics, with means and standard deviations reported for quantitative variables, and absolute and relative frequencies for categorical variables. Due to the small sample size ($n = 20$) and heterogeneity across tumor stages, no inferential or survival analyses were performed, as these could introduce significant statistical bias.

This retrospective study was authorized by the Instituto Guatemalteco de Seguridad Social (IGSS) for the dissemination of anonymized institutional data. As no personal identifiers were included, individual informed consent was not required. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

RESULTS

A total of twenty patients with histologically confirmed pancreatic cancer were included during the study period. The mean age at diagnosis was 57 years ($SD \pm 20.2$), and 65% were male. Most patients (65%) resided in urban areas, while 35% came from rural regions. The most frequent comorbidities were diabetes mellitus (35%) and hypertension (30%). Abdominal pain was the predominant presenting symptom, reported in 90% of patients, followed by weight loss in 45% and jaundice in 25% (**Table 1**).

Variable	n (%)
Mean age (years, SD)	57 (\pm 20.2)
Origin	Urban: 13 (65) / Rural: 7 (35)
Diabetes mellitus	7 (35)
Hypertension	6 (30)
Abdominal pain	18 (90)
Weight loss	9 (45)
Jaundice	5 (25)

Table 1 Clinical characteristics of pancreatic cancer patients (2024–2025)

At diagnosis, 55% of patients had a favorable performance status (ECOG 0–1), while 45% presented significant functional limitation (ECOG \geq 2). Tumor location was predominantly in the pancreatic head (65%), followed by tail (15%), more than two regions (15%), and body (5%).

Half of the patients were diagnosed at stage IV, 30% at stage I, and 20% at stage II. Metastatic disease was present in 50%, most frequently in the liver (30%), followed by lung (5%), peritoneum (5%), and multiple sites (10%). Vascular invasion was documented in 45%. Ductal adenocarcinoma accounted for 70% of histological diagnoses (**Table 2**).

Regarding treatment, 40% underwent surgery with curative intent, 25% received systemic chemotherapy, and 50% were managed with palliative care. Chemotherapy regimens included gemcitabine (15%), FOLFIRINOX (10%), and capecitabine (5%). Radiotherapy was given in 10% of cases (**Table 3**).

DISCUSSION

Although previous institutional reports have described the incidence and mortality of pancreatic cancer in Guatemala, this study provides a more detailed and descriptive analysis of the clinical, etiologic, and therapeutic characteristics of affected patients. Conducted at the Hospital General de Enfermedades of the Instituto Guatemalteco de Seguridad Social (IGSS), this series offers a more comprehensive understanding of how individual clinical profiles, comorbidities, and access to treatment intersect with socioeconomic barriers in the Guatemalan setting^{4,5}.

The results confirm that pancreatic cancer continues to be diagnosed predominantly at advanced stages, with half of

Variable	n (%)
ECOG 0	4 (20)
ECOG 1	7 (35)
ECOG 2	3 (15)
ECOG 3	3 (15)
ECOG 4	3 (15)
Tumor site: Head	13 (65)
Tumor site: Body	1 (5)
Tumor site: Tail	3 (15)
>2 regions	3 (15)
Stage I	6 (30)
Stage II	4 (20)
Stage III	0 (0)
Stage IV	10 (50)
Metastasis: Liver	6 (30)
Metastasis: Lung	1 (5)
Metastasis: Peritoneum	1 (5)
Multiple	2 (10)
Vascular invasion	9 (45)
Adenocarcinoma	14 (70)
Papillary	3 (15)
Other	3 (15)

Table 2 Pathological characteristics

Treatment type	n (%)
Surgery	8 (40)
Chemotherapy	5 (25)
Palliative care	7 (50)
Regimen: Gemcitabine	3 (15)
Regimen: FOLFIRINOX	2 (10)
Regimen: Capecitabine	1 (5)
Radiotherapy	2 (10)

Table 2 Therapeutic modalities

the patients presenting with stage IV disease. This pattern is consistent with reports from other low- and middle-income

countries, where the absence of screening programs and limited access to imaging and specialized endoscopic procedures delay detection and referral. The predominance of ductal adenocarcinoma and the high rate of hepatic metastasis in this cohort are comparable to findings in regional and international series, reinforcing the aggressive and late-presenting nature of the disease^{14,15,16,17}.

Regarding treatment, although the IGSS oncology service has access to advanced chemotherapy regimens such as FOLFIRINOX, their use in this cohort was limited by patient related clinical factors. Many patients were elderly, presented with poor functional status (ECOG ≥ 2), or had significant comorbidities such as diabetes and hypertension, which restricted tolerance to intensive regimens. As a result, most patients received gemcitabine-based therapy or were managed with palliative and supportive care. The predominance of palliative management in this series reflects not a lack of institutional resources but rather the advanced stage of presentation and the poor clinical reserve of the population studied^{7,11,12,13}.

It is also important to clarify that poor outcomes observed in patients receiving palliative care are a consequence of the late stage at diagnosis, not of the palliative approach itself. On the contrary, early integration of palliative services is essential to address pain control, nutritional decline, psychological distress, and end-of-life needs, thereby improving quality of life. Strengthening referral pathways and promoting early co-management with palliative care could substantially benefit patients with advanced pancreatic cancer in Guatemala^{14,17}.

The observed increase in institutional case reporting compared with historical data likely reflects improvements in diagnostic infrastructure, cancer registration, and referral patterns rather than a true increase in disease incidence. However, the limited number of histologically confirmed cases available for this analysis (n = 20) reveals persistent barriers to biopsy confirmation and systematic data capture in local oncology practice. Establishing a structured national pancreatic cancer registry could help overcome these challenges and guide public health interventions^{4,5}.

Our findings are consistent with those reported in other low- and middle-income countries such as Peru, Colombia, India, and Sub-Saharan Africa, where late-stage presentation and limited access to surgery and systemic therapy remain key determinants of poor outcomes. These regional similarities highlight the systemic nature of healthcare disparities affecting pancreatic cancer management in resource-limited settings^{14,15,16,17}.

CONCLUSION

Overall, this study highlights the clinical complexity and social inequities surrounding pancreatic cancer care in Guatemala. Addressing these gaps requires a coordinated national effort to improve early diagnosis, optimize patient selection for curative and systemic treatments, and strengthen the integration of multidisciplinary and palliative care programs within the IGSS and broader health system⁴.

Finally, the marked discrepancy between the 53 cases reported over 12 years in the 1990s and the 350 cases documented within five years at IGSS likely reflects improvements in diagnostic capacity, referral patterns, and institutional reporting rather than a true rise in incidence. This supports the need for a standardized national registry for pancreatic cancer in Guatemala. Although our study did not directly assess operational barriers in palliative care, the predominance of advanced-stage presentation inherently places most patients on palliative pathways. Thus, the challenges observed stem not from limited therapeutic availability, but from the clinical reality of late diagnosis and poor functional status driving the need for supportive management^{4,5}.

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REFERENCES

1. Siegel RL, Kratzer TB, Giaquinto AN, Sung H, Jemal A. Cancer statistics, 2025. *CA Cancer J Clin.* 2025;75(1):10-45.
2. Hidalgo M. Pancreatic cancer. *N Engl J Med.* 2010;362(17):1605-17.
3. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2021;71(3):209-49.
4. Cáceres de León P. Perfil epidemiológico de los pacientes con cáncer de páncreas en el INCAN: estudio retrospectivo-descriptivo 1988-1999 [Tesis de licenciatura en Internet]. Guatemala: *Universidad de San Carlos de Guatemala, Facultad de Ciencias Médicas*; 2002.
5. Ramírez RA, Rosales DE. Current perspective of gastro-intestinal cancer in Guatemala. *Onco Daily Med J.* 2025;2(7):4309.

6. Tempero MA, Malafa MP, Al-Hawary M, Behrman SW, Benson AB, Cardin DB, et al. Pancreatic adenocarcinoma, version 2.2021, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw*. 2021;19(4):439-57.
7. Conroy T, Desseigne F, Ychou M, Bouché O, Guimbaud R, Bécoarn Y, et al. FOLFIRINOX versus gemcitabine for metastatic pancreatic cancer. *N Engl J Med*. 2011;364(19):1817-25.
8. Von Hoff DD, Ervin T, Arena FP, Chiorean EG, Infante J, Moore M, et al. Increased survival in pancreatic cancer with nab-paclitaxel plus gemcitabine. *N Engl J Med*. 2013;369(18):1691-703.
9. Marabelle A, Le DT, Ascierto PA, Di Giacomo AM, De Jesus-Acosta A, Delord JP, et al. Efficacy of pembrolizumab in patients with non-colorectal high microsatellite instability/mismatch repair-deficient cancer: results from the phase II KEYNOTE-158 study. *J Clin Oncol*. 2020;38(1):1-10.
10. Golan T, Hammel P, Reni M, Van Cutsem E, Macarulla T, Hall MJ, et al. Maintenance olaparib for germline BRCA-mutated metastatic pancreatic cancer. *N Engl J Med*. 2019;381(4):317-27.
11. Hammel P, Van Cutsem E, Macarulla T, et al. Adjuvant FOLFIRINOX for pancreatic cancer: a standard of care in Europe? Updated results from the PRODIGE 24/CCTG PA.6 trial. *J Clin Oncol*. 2018;36(15):e16260.
12. Conroy T, Hammel P, Hebbar M, et al. PRODIGE 24/ CCTG PA.6: a randomized trial of adjuvant mFOLFIRINOX versus gemcitabine in resected pancreatic adenocarcinoma — final results. *J Clin Oncol*. 2018;36(18):LBA4001.
13. Carrasco G, Flores L, Benites J, et al. Sobrevida del adenocarcinoma ductal de páncreas. *Rev Gastroenterol Peru*. 2022;42(3):201-208.
14. Noel M, Fiscella K. Disparities in pancreatic cancer treatment and outcomes. *Health Equity*. 2019;3(1):532-540.
15. Padhy AS, Puvvada R, Nittala R, Menon VS, Arora SR, Basani M. Analysis of short-term outcomes of pancreatic resections from a low-volume centre in a Tier II city in India. *Indian J Surg Oncol*. 2025;1-9.
16. Argüello Arias PT. Cáncer de páncreas. Revisión de tema. *Rev Col Gastroenterol*. 2006;21(3):190-195.
17. Liu W, Rao L, Qiao Z, Wang G, Li B, Shen G. Global disparities in the burden of pancreatic cancer (1990–2021): insights from the 2021 Global Burden of Disease study. *BMC Cancer*. 2025;25(1):722.

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