

Outcome of cholecystectomy in diabetic patients

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ABSTRACT

Background: Mortality and morbidity from gallstones in the diabetic patients in comparison with the nondiabetics are always controversial. **Aims:** To evaluate the risk factors associated with morbidity from gallstones. **Materials and Methods:** We have analyzed data from 669 cholecystectomies performed between March 2002 and December 2003. **Results:** Among 669 patients, 116 had complications. Complications included 68 adhesions, 26 gangrenes of the gallbladder, 14 pancreatitis, 20 hydroses, and 5 perforations. In univariate analysis, age, diabetes, hypertension, and ischemic heart disease were significantly associated with high risk of complications. In multivariate analysis, only diabetes caused a significant increase in complications with odds ratio (OR) of 6.1 [95% Confidence Interval (CI): 3.8-9.9]. Diabetes was also significantly associated with high risk of adhesion (OR = 5.9; 95% CI: 3.3-10.5), gangrene (OR = 7.6; 95% CI: 3.1-18.5) and pancreatitis (OR = 4.5; 95% CI: 1.3-15.8). **Conclusion:** Although this study does not directly support prophylactic cholecystectomy, the increased morbidity in the diabetics implies that diabetic patients with asymptomatic gallstone need more care and attention.

Key Words: Diabetes; gallstone; prophylactic cholecystectomy

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It is generally believed that patients with diabetes are at high risk of developing gallstones.^[1] However, mortality and especially morbidity from gallstones in the diabetic patients in comparison with the nondiabetics have always been controversial. Previous studies have detected increased complications and mortality rates,^[2-4] and hence suggested prophylactic cholecystectomy for gallstones in the diabetics,^[5,6] while others have justified increased morbidity in the diabetics as a result of older age and co-morbid medical conditions,^[7] and a few have denied such a difference.^[8,9]

To date, few studies have assessed intraoperative findings of cholecystectomy in diabetics. In this study, we compared operative findings of cholecystectomy in the diabetic patients

with the nondiabetics, after adjusting for other potential confounders.

MATERIALS AND METHODS

Our study included 669 open cholecystectomies performed on patients with gallstones between March 2003 and December 2004. It was a retrospective study and data were stored in documented files, and the same person retrieved all the data. The study was approved by the human research review committee. Patients' records were reviewed carefully to gather the study data including sex, age, presence of diabetes, hypertension, ischemic heart disease, and the operative findings. Diabetes was diagnosed when there had been treatments for diabetes before the admission or when the patient had had fasting serum glucose level higher than 126 mg/dl on more than one occasion during hospitalization. Operative reports were reviewed carefully in each case to determine intraoperative findings including normal gall bladder, hydroses, gangrene, adhesion, perforation of gall bladder, and pancreatitis. The relative risks were calculated for each factor with 95% confidence intervals of limit. Mul-

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tivariate analysis was performed using the logistic regression model, after adjusting for all potential risk factors.

RESULTS

A total of 669 patients were included in our study consisting of 167 men and 502 women with their mean age of 52 years (Table 1). Among 669 patients, 119 were diabetics. Compared to the nondiabetics, diabetics were older in age but equally likely to be women (Table 1). Ischemic heart disease and hypertension were more common in the diabetics than in the nondiabetics.

Incidence of any abnormal operative findings was 44.5% in the diabetics, significantly higher than the nondiabetics with prevalence of 11.5% [Relative Risk (RR) 3.9; 95% CI: 2.9-5.3]. Gangrenous gall bladder was seen in 14.3% in the diabetics compared to 1.6% in the nondiabetics (RR: 8.7; 95% CI: 3.8-20.8). Diabetes also caused a significant increase in the risk of adhesion (28.6% vs 6.2%) and pancreatitis (5.9% vs 1.3%) with the RR of 4.6 (95% CI: 2.9-7.3) and 4.6 (95% CI: 1.5-14.4), respectively. However, incidence of hydrops and perforation in the diabetics was not significantly higher than in the nondiabetics.

In the multivariate analysis, using the logistic regression model (Table 2), diabetes was associated with high risk of gangrene (OR: 7.6; 95% CI: 3.1-18.5), adhesion (OR: 5.9; 95% CI: 3.3-10.5), and pancreatitis (OR: 4.5; 95% CI: 1.3-5.8) but did not cause a significant increase in the risk of hydrops or perforation. Age, sex, ischemic heart disease, and hypertension were not associated with higher rates of any of the outcome variables, which we have studied.

DISCUSSION

In this study, we detected a higher incidence of advanced inflammatory changes in the gall bladder of the diabetics. The higher rate of gangrene and nonsignificant increased risk of perforation is compatible with the study performed by Landau et al., who detected

Table 1: Baseline characteristics of the patients

	Diabetics	Non-diabetics	Total
Number	119	550	669
Male/female	35/84	132/418	167/502
Age (mean±SD)	59.1±12.8*	51.1±16.3	52.6±16
Hypertension	47(39.5)*	74(13.2)	121(18.1)
Ischemic heart disease (%)	32(26.9)*	40(7.3)	72(10.8)
Adhesion (%)	34(28.6)*	34(6.2)	68(10.2)
Gangrene (%)	17(14.30)*	9(1.6)	26(3.9)
Pancreatitis (%)	7(5.9)*	7(1.3)	14(2.1)
Hydrops (%)	4(3.4)	16(2.9)	20(3.0)
Perforation (%)	1(0.8)	4(0.7)	5(0.7)
Any abnormal finding (%)	53(44.5)*	63(11.5)	116(17.3)

*Significantly difference from the nondiabetics.

Table 2: Multivariate analysis of the association between risk factors and operative findings based on logistic regression model

	Diabetes OR (95% CI)	Age P value	Sex OR (95% CI)	IHD OR (95% CI)	Hyper-tension OR (95% CI)
Gangrene	7.6 (3.1-18.5)	0.13	2.0 (0.8-4.8)	1.0 (0.4-2.8)	1.5 (0.6-3.9)
Adhesion	5.9 (3.3-10.5)	0.73	1.0 (0.5-1.9)	0.9 (0.4-1.9)	1.1 (0.6-2.1)
Pancreatitis	4.5 (1.3-15.8)	0.29	1.4 (0.5-1.9)	2.3 (0.6-8.9)	2.0 (0.6-7.3)
Hydrops	1.9 (0.6-6.3)	0.06	0.6 (0.2-2.0)	1.5 (0.3-7.6)	0.2 (0.0-1.9)
Perforation	1.1 (0.1-11.0)	0.18	1.6 (0.3-10.6)	0 (0.3-7.6)	1.1 (0.1-11.3)
Total	6.1 (3.8-9.9)	0.12	1.1 (0.6-2.1)	1.1 (0.6-2.1)	1.0 (0.6-1.7)

IHD, Ischemic heart disease, OR, odds ratio, CI, confidence interval

33% incidence of gangrene in the diabetics vs 22% in the nondiabetics.^[3] In one of the previous studies, the rate of gangrene in the diabetics was similar to the nondiabetics (26.4% vs 25%), but that study included only the acute cholecystitis patients.^[4] Perforations of the gall bladder have been reported higher in some previous studies,^[7] but because of very low risk of perforation in our study we did not detect a higher rate of this complication in the diabetics. Although diabetics in our study are older and more likely to have hypertension or Ischemic heart disease, the independent role of diabetes on operative findings in multivariate analysis is in contrast with the idea that increased morbidity in these patients is as a result of older age and concurrent medical disease, claimed in some previous studies. Today with increasing popularity of laparoscopic cholecystectomy and also due to its safety and less expenses and on the other hand, higher morbidity and mortality of emergency cholecystectomy compared to early elective surgery,^[10] prophylactic surgery for gallstones in the diabetics is still in dispute. Although the results of our study do not justify performing prophylactic cholecystectomy in the diabetics with gallstones, but markedly high incidence of advanced inflammatory changes is in favor of expeditious management of gallstones in these patients. However, further studies are required for a better understanding of the pathophysiology of inflammation in the gall bladder of the diabetics.

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Forthcoming Events

EVENT DATE, VENUE CONTACT	10th CSEP & Operative Workshop on Surgery <i>July 23rd / 24th, 2005, GGH, Pondicherry</i> Dr. K. P. Singh, 33, HIG House, Ashok Nagar, Pondicherry - 605 008, India. Tel.: 0413 2251966, 2250667-R, 2338105. E-mail: doc-singh@eth.net / drsinghkp@yahoo.com
EVENT DATE, VENUE CONTACT	NCASICON 2005: 25th Annual Conference of Northern Chapter of Association of Surgeons of India <i>October 2nd - 3rd 2005, Patiala</i> Prof. Surinder Singh, Organizing Secretary, Deptt. of General Surgery, Govt. Medical College and Rajindra Hospital, Patiala, India. E-mail: ncasicon2005@rediffmail.com
EVENT DATE, VENUE CONTACT	ACRSICON - 2005 <i>October 4th - 9th, 2005, Lucknow, India</i> Ashok Kumar, The Organising Secretary, Department of Surgical Gastroenterology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow - 226014, India. Ph.: +91-522-2668700, 2668800, Ext. 2401, 2423 (Office) Mobile: 9415403373, 9415578278 Fax: +91-522-2668017, E-mail: acrsi2005@yahoo.co.in / ak Gupta@sgpgi.ac.in
EVENT DATE, VENUE EVENT DATE, VENUE CONTACT	9th Advanced Instructional Course <i>October 4th - 9th, 2005, SGPGI, Lucknow</i> 28th National Conference of ACRSI <i>October 7th - 9th, 2005, SGPGI, Lucknow</i> Dr. Ashok Kumar. Tel: 0522-2668700-800-900. Ext: 2423 (o) 2424(r). E-mail: akgupta@sgpgi.ac.in, ashokakgupta@yahoo.co.in. Dr. R. B. Singh. Tel: 0522-2781817, M-094154-03373. E-mail: rbsingh@surgeon-gastro.com / rbsingh@hotmail.com
EVENT DATE, VENUE CONTACT	XVth Joint Congress of Asia and Pacific Federations of International College of Surgeons and 51st Annual Conference of the Indian Section jointly with West Zone Conference of IAGES <i>November 24th - 27th 2005. Mumbai</i> Dr. H. S. Bhanushali, Organising Chairman, Congress Secretariat: ASIAPACIFICON 2005, International College of Surgeons – Indian Section, I.M.A House, 16, Keshavrao Khadye Marg, Haji Ali, Mumbai - 400034, India. Tel: (91) (22) 24934358 / 56045739. Website: www.icsis.org. E-mail: icsis@rediffmail.com
EVENT DATE, VENUE CONTACT	GUJSURGCON-2005 <i>December 2nd - 4th, 2005, Nadiad</i> Dr. Vipul Shah, The Organising Secretary, Urvis Hospital, Manglam Complex, Rabarivad NADIAD. Tel.: 0268-2568462, 2528658 (M) 94264-02856