Re: ABO Blood Group and the Risk of Pancreatic Cancer

Pancreatic cancer is the fourth leading cause of cancer-related mortality in the United States (1). Obesity, tobacco use, and family history are well-established risk factors for the development of pancreatic cancer (2,3). Previous studies have also suggested a link between ABO blood group and risk of pancreatic cancer (4,5). More recently, the association of ABO blood type with pancreatic cancer risk was illuminated by a prospective study by Wolpin et al. in the Journal (6), which demonstrated that people in non–O blood groups were at increased risk of developing pancreatic cancer (adjusted hazard ratio = 1.44; 95% confidence interval [CI] = 1.14 to 1.82). This epidemiological observation was further supported by a recent genome-wide association study (7) that identified the association of a particular ABO locus on chromosome 9q34 with susceptibility to pancreatic cancer. Risk factors may also have prognostic significance, as exemplified by a prospective study (3) that showed that obesity was both a risk factor and a prognostic factor for pancreatic cancer. To date, the impact of ABO blood type on clinical outcome in patients with pancreatic cancer has not been examined. We performed a retrospective analysis to determine the prognostic significance of ABO
blood type among patients whose pancreatic adenocarcinomas were resected.

We used a prospectively maintained surgical database at Washington University in St Louis, which contained demographic, surgical, pathological, and survival data on 417 patients with pancreatic adenocarcinoma who underwent pancreatic resection between 1995 and 2008. Among them, 364 (87%) patients had adenocarcinoma at the head of the pancreas and underwent pancreaticoduodenectomy, whereas 53 (13%) patients underwent distal pancreatectomy for adenocarcinoma in the distal pancreas. Using a χ² test, we found that the distribution of ABO blood types in patients with pancreatic cancer was statistically significantly different from the normal distribution in the US population (P < .001). The distribution of blood types among all patients with pancreatic cancer included fewer individuals with O-type blood than the distribution in the general US population. Among the patients in our study population, 350 (83.9%) of the 417 patients were white, 127 (30.5%) had blood type O, 202 (48.4%) type A, 20 (4.8%) type AB, and 68 (16.3%) type B. The US white population in general, by comparison, comprised an average of 45% persons with blood type O, 40% type A, 4% type AB, and 11% type B (6). Our results are consistent with the current literature, which show an increased incidence of pancreatic cancer among persons with non-O blood types.

The impact of ABO blood type on survival was evaluated by the Kaplan–Meier method and two-sided log-rank test. We found no statistical difference in overall survival among the blood groups (P = .196) (Figure 1). The median overall survival times were comparable: blood type A, 21.6 months (95% CI = 17.8 to 27.8 months); blood type B, 19.9 months (95% CI = 16.5 to 26.9 months); blood type AB, 18.5 months (95% CI = 8.3 to 25.8 months); and blood type O, 18.9 months (95% CI = 12.5 to 22.9 months). Compared with persons with blood type O, the hazard ratios for overall survival of persons with blood types A, B, and AB were 0.803 (95% CI = 0.610 to 1.058), 0.923 (95% CI = 0.647 to 1.316), and 1.293 (95% CI = 0.758 to 2.206), respectively.

In summary, although non-O blood type confers an increased risk for the development of pancreatic cancer, it does not appear from this sample population to affect overall survival among patients undergoing resection for pancreatic cancer. The study, however, is limited to a population with resectable disease, which accounts for about 20% of patients with pancreatic cancer. Information for patients with locally advanced and metastatic disease was difficult to obtain by retrospective analysis because those patients were not surgical candidates and their ABO blood types were not specifically assessed. The impact of ABO blood type on malignant potential and prognosis in patients with all stages of pancreatic cancer remains an interesting area of research and one that warrants further investigation.

**Figure 1.** Overall survival, by blood type, among patients undergoing surgical resection of pancreatic cancers. A) Overall survival, by ABO blood type, for all patients with resected pancreatic adenocarcinoma. The 2-year overall survival rates, by blood type, were as follows: for blood type A, 46.0% (95% confidence interval [CI] = 38.4% to 53.2%); for blood type AB, 29.3% (95% CI = 10.9% to 50.7%); for blood type B, 44.1% (95% CI = 31.0% to 56.3%); and for blood type O, 39.6% (95% CI = 30.4% to 48.6%). The 5-year survival rates were as follows: for type A, 29.5% (95% CI = 22.3% to 37.0%); for blood type AB, 7.8% (95% CI = 0.5% to 28.6%); for blood type B, 19.3% (95% CI = 9.7% to 31.2%); and for blood type O, 21.2% (13.6% to 29.8%). There was no statistically significant difference between blood types for overall survival by the two-sided log-rank test (P = .196). B) Overall survival, by ABO blood type, for patients with pancreatic adenocarcinoma in the head of pancreas who underwent pancreaticoduodenectomy. The 2-year survival rates, by blood type, were as follows: for blood type A, 43.50% (95% CI = 35.6% to 51.1%); for blood type AB, 26.6% (95% CI = 8.4% to 49.2%); for blood type B, 40.3% (95% CI = 26.9% to 53.3%); and for blood type O, 40.2% (95% CI = 30.3% to 49.9%). The 5-year survival rates were as follows: for type A, 26.1% (95% CI = 18.9% to 33.9%); for blood type AB, 0%; for type AB, 0%; for type B, 17.9% (95% CI = 8.4% to 30.2%); and for type O, 21.5% (13.5% to 30.8%). There was no statistically significant difference between blood types for overall survival by the two-sided log-rank test in group (P = .316).

**References**


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