Epidemiology of Portal Vein Thrombosis

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Abstract

Non-malignant portal vein thrombosis may occur in patients with and without cirrhosis. Epidemiological large/nationwide studies are missing, conditioning a lack of information concerning real incidences and prevalence rates of portal vein thrombosis in both contexts. Yet, portal vein thrombosis is more often diagnosed in patients with cirrhosis than without, and in those with cirrhosis, it is most commonly perceived in patients with more severe liver disease, who are candidates for liver transplantation. Nevertheless, portal vein thrombosis in cirrhosis is also a non-negligible event in patients with a stable liver disease, with a 5-year incidence up to 11%.

Keywords

Portal vein thrombosis · Cirrhotic · Non-cirrhotic · Epidemiology · Incidence Prevalence

Portal vein thrombosis (PVT), one within a multitude of vascular disorders of the liver, may arise in patients with and without cirrhosis, expressing different milieus and specific risk factors (see Chap. 3), accordingly. Importantly, it must be differentiated from malignant invasion of the portal vein, as its etiology, clinical approach, and prognosis are different. Yet, in the past, malignant invasion of the portal vein tract and non-malignant PVT were considered somehow the same entity, which

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interfered with the evaluation of the real incidence and prevalence of the latter. Also, the discrepant results of PVT's incidences and prevalence rates reflect different study designs and methodological approaches (most of them were retrospective or cross-sectional in nature), geographic regions, as well as different diagnostic procedures of PVT diagnosis. Furthermore, the indistinct use of the terms incidence and prevalence in the literature interferes with epidemiological data interpretation. This chapter reviews the epidemiology of PVT in patients with and without cirrhosis, leaving apart from malignant invasion, narrowing of the portal vein lumen due to extrinsic compression, or in the context of any other malignancy and related prothrombotic state.

2.1 Portal Vein Thrombosis (Non-cirrhotic)

There is a lack of information considering epidemiological data restricted to PVT in non-cirrhotic patients. Two population-based retrospective studies conducted in Sweden and in Italy, gathering patients with and without cirrhosis, with and without associated malignancy, and with recent and chronic PVT, found an annual incidence rate of 0.7/100,000 and a prevalence rate of 3.7/100,000 inhabitants in the first report [1], and gender-specific incidence rate of 3.78/100,000 inhabitants in males and of 1.73/100,000 inhabitants in females in the second study [2]. Another ancient Swedish report based on the study of 23,796 autopsies found an overall PVT prevalence, irrespective of the underlying etiology, to be 1.1% [3]. If excluding patients with cirrhosis or malignancy and including only patients with PVT and underlying myeloproliferative disorder, major abdominal infections/inflammation, and no attributed cause, the number lowers significantly to 0.3% [3]. Even though considered to be relatively rare, non-cirrhotic and non-malignant PVT is estimated to be the second most frequent cause of portal hypertension in the world [4].

2.2 Portal Vein Thrombosis (Cirrhotic)

There are several studies reporting incidence and prevalence rates of PVT among patients with cirrhosis (Fig. 2.1). Hitherto, there is an important discrepancy between different geographic locations, different methodologies applied to diagnose PVT, different study designs, and different grades of severity of cirrhosis. In England, in 1954, a 13% prevalence of PVT was documented in a cohort of 134 patients with portal hypertension, the majority of whom had decompensated liver disease [5]. In Hong Kong, in 1965, in a necropsy study gathering 126 patients with cirrhosis, mural thrombi involving portal vein were found in 25.4% of them [6]. In opposition to these high prevalence rates, in Japan, in 1985, a very low rate of PVT, estimated at 0.6%, was reported in 708 patients followed up for a 10-year period in a mixed population of Child–Pugh class A to C patients (the majority, Child–Pugh class C) [7]. The diagnosis was based on angiographic studies (either transhepatic or superior mesenteric arterial portography). Other ancient reports, also using

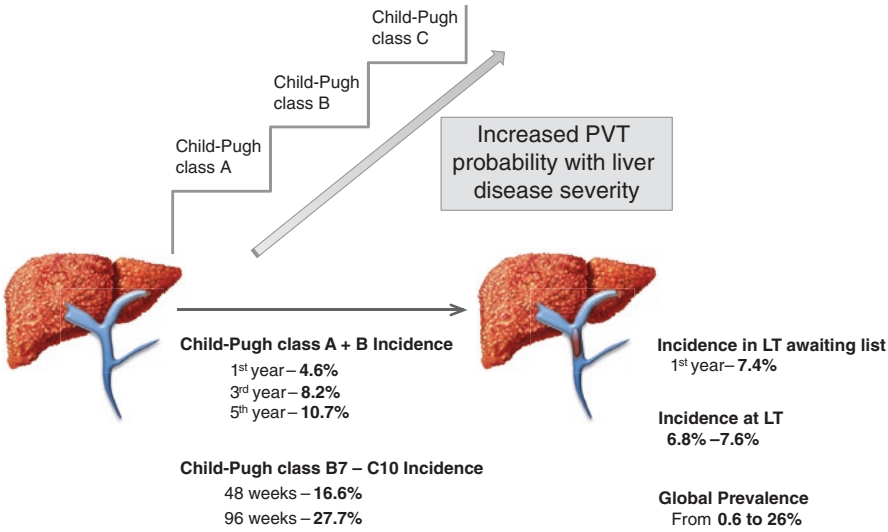

Fig. 2.1 Incidence and prevalence rates of portal vein thrombosis in patients with cirrhosis considering liver disease severity and at liver transplantation. *PVT* portal vein thrombosis, *LT* liver transplantation

invasive diagnostic tools, such as surgical technics or angiography, are in line with the heterogeneity of the aforementioned results, with prevalence rates ranging from 5.2% to 21% [8–12]. Even so, the highest prevalence rates of PVT are those reported among patients undergoing liver transplantation (LT), reflecting more severe underlying liver disease. Nonami et al. reported a 15.7% PVT prevalence by the time of LT in patients with end-stage cirrhosis [13]. Gayowski et al., in a cohort of 88 American veterans, found an even higher prevalence of 26% by the time of LT [14]. All of them were Child–Pugh class C. After excluding patients with HCC, another study documented a prevalence of PVT at LT of 17.5% [15]. In a cohort of patients listed for LT and longitudinally followed up, a 1-year incidence of PVT of 7.4% was reported, with the diagnosis made by abdominal Doppler ultrasound [16]. Most of the studies that report epidemiological data on PVT include predominantly patients with advanced liver disease, even if not on a LT waiting list. Amitrano et al. reported PVT prevalence of 11.2% in 701 patients admitted to the hospital (90% were Child–Pugh class B and C), most of them due to an acute episode of liver disease decompensation [17]. Villa et al., in a group of Child–Pugh B7-C10 cirrhotic patients, found PVT up to 16.6% per year [18]. Zocco et al., in a prospective assigned study enrolling a mixture of 81 Child–Pugh class A to C cirrhotic patients, showed a 1-year incidence of PVT of 15% [19]. More recently, Nery et al., in a cohort of patients with less severe cirrhosis (mostly Child–Pugh class A) prospectively surveyed, found a 1-, 3-, and 5-year incidence of PVT of 4.6%, 8.2%, and 10.7%, respectively [20]. An American nationwide retrospectively conducted study based on more than three million hospital discharges of patients with decompensated liver cirrhosis and clinically significant portal hypertension revealed a 1.5% global

prevalence of PVT. Importantly, the diagnosis was increasingly recognized as the years go by, with an annual percentage change of 9%, which can be related to an increased awareness for the diagnosis and the generalized use of imaging studies [21].

In short, PVT in cirrhosis has (a) different reported geographically prevalence rates, which can translate different loco-regional risk factors or reflect different diagnostic procedures or follow-up strategies of patients with cirrhosis; (b) an increased incidence and prevalence with an increase in the severity of underlying liver disease, which has been well documented particularly in patients awaiting liver transplantation; and (c) been identified to be a non-negligible event also in patients with non-severe cirrhosis with a 5-year incidence up to almost 11%.

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