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Smoking and cardiovascular risk in diabetes mellitus

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INTRODUCTION

There are a number of hazards associated with smoking in patients with diabetes mellitus. These are reviewed here. The possible association between smoking and the development of type 2 diabetes is discussed separately. (See "[Prediction and prevention of type 2 diabetes mellitus](#)".)

HEALTH HAZARDS OF SMOKING

The health hazards of cigarette smoking in the general population are well known. In patients with diabetes mellitus, smoking causes a substantial increase in risk for both macrovascular and microvascular disease [1]. This is illustrated by the following observations of smokers and nonsmokers with diabetes:

- Smoking is an independent risk factor for all-cause mortality, due largely to cardiovascular disease [2].
- There is a dose-response relationship between current smoking status and risk of coronary disease in women with diabetes (RR 1.7 [95% CI 1.1-2.5] and 2.68 [CI 2.1-3.5] for 1 to 14 and >15 cigarettes per day, respectively) [3]. The risk returns to baseline in those who had stopped smoking for more than 10 years [3].
- The risk of mortality in diabetic women also increases with the number of cigarettes smoked per day (RR 1.4 [CI 1.0-2.1] and 2.1 [CI 1.3-3.7] for 1-14 and >35 cigarettes/day, respectively), and decreases substantially 10 years after quitting smoking (RR 1.1 [0.9 to 1.4]) [4].
- Smoking is associated with increases in the serum concentrations of total cholesterol and very-low-density lipoprotein cholesterol, a decrease in serum high-density-lipoprotein cholesterol concentrations, and a greater degree of insulin resistance [5].
- Smokers, via an uncertain mechanism, have poorer glycemic control [6,7].
- In patients with type 1 diabetes, smoking is independently associated with an increase in urinary albumin excretion and nonproliferative retinopathy; the degree of albuminuria

falls to the level of nonsmokers if smoking is discontinued [7,8]. These changes are in part due to changes in glycemic control [7].

- Smokers with either type 1 or type 2 diabetes are at increased risk for neuropathy, an effect that persists after adjusting for glycemic control [9].
- Smoking is associated with an increased risk of end-stage renal disease and with decreased survival once dialysis is commenced [10,11]. In one report, as an example, the one- and five-year survival rates on hemodialysis in diabetic patients was substantially lower in those who smoked compared with nonsmokers (68 versus 80 percent, and 9 versus 37 percent, respectively [11].
- In patients with type 1 diabetes, those who smoke have higher plasma concentrations of intercellular adhesion molecule 1 (ICAM-1), a marker of endothelial dysfunction than those who don't smoke [12].

The American Thoracic Society (ATS) statement on cigarette smoking and health, as well as other ATS guidelines, can be accessed through the ATS web site at www.thoracic.org/sections/publications/statements/index.html.

SMOKING CESSATION

The above findings indicate that smoking cessation is one of the most important aspects of therapy in patients with diabetes [13]. A report from the World Health Organization multinational study further supports this conclusion [14]. In a cohort of 4427 patients with diabetes, the relative risk of all-cause mortality was higher in those who had recently quit smoking compared with those who had quit over 10 years before (1.5 versus 1.2), or who had never smoked (relative risk 1.0); it was highest in those who had smoked the longest (1.7 for those who smoked for more than 30 years). Thus, the risk for diabetic patients who smoke remains high for several years after they quit and is related to the overall duration of smoking. As a result, patients with diabetes should be encouraged to quit smoking as soon as possible. (See "[Patterns of tobacco use and benefits of smoking cessation](#)".)

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