To Drink or Not to Drink: That Is the Question

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Although epidemiology is a highly respected and important branch of medicine and public health, many studies turn out to be confounded, of limited usefulness, or of little interest. However, the importance of the field is emphasized by the appearance of “black swan” events, defined as occurrences that are not expected, are unpredictable and have a significant impact. Examples include the relationship between smoking and lung cancer, the link between high serum cholesterol and atherosclerosis, and the risk of skin cancers from excessive exposure to sunlight. One of the most recent and potentially useful “black swans” relates to numerous epidemiological studies that demonstrate beneficial effects of moderate alcohol consumption.

Many publications that have demonstrated a benefit of moderate drinking include the admonition that abstainers should not be encouraged to begin drinking alcoholic beverages because of the risk of alcohol abuse. However, the incidence of lifelong abstainers who begin drinking at the age of about 40 years and who then become chronic alcoholics is trivial (Grant and Dawson, 1997; Mahalick et al., 2013; Verges et al., 2012) and new drinking habits at that age would generally be restricted to the level of 1 standard drink (14 g ethanol [EtOH]) a day. This could take the form of an occasional cocktail, wine, or beer with dinner, etc. Considering the rates of absorption and metabolism of EtOH, blood alcohol levels should be too low to impair driving or other motor skills. In any event, any putative risk of excessive alcohol consumption by middle-aged abstainers should be measured against the benefits of moderate alcohol ingestion. The most important parameter to be considered is probably all cause mortality, although I list specific benefits in the following discussion.

All Cause Mortality

The deleterious effects of alcohol abuse on lifespan are so well known that they do not merit a further discussion here. However, in the lay press and media, the beneficial effects of moderate alcohol consumption are still controversial. Yet in the epidemiology literature, it is well established that a graph of mortality versus alcohol consumption consistently demonstrates a J-shaped curve, that is, low levels reduce mortality, whereas high levels increase it (Castelnovo et al., 2006; Ford et al., 2011; Lee et al., 2009; Sun et al., 2011; Thun et al., 1997). It is reasonable to base a risk/benefit ratio on all cause mortality, rather than specific disorders.

Coronary Artery Disease

Recent studies have confirmed older studies that demonstrated a protective effect against coronary artery disease by moderate alcohol consumption (Arriola et al., 2010; Hvidtfeldt et al., 2010; Movva and Figueredo, 2013; Mukamal et al., 2003, 2006; Rimm and Moats, 2007). These data are based mostly on the incidence of myocardial infarction, an event closely tied to occlusive coronary atherosclerosis. Light alcohol intake also reduces the risk of sudden cardiac death (Chiuve et al., 2010), which is linked to both myocardial infarction and cardiac arrhythmias. In men who survived a myocardial infarction, long-term moderate alcohol consumption was inversely associated with both all cause and cardiovascular mortality (Pai et al., 2012). The precise pathophysiologic mechanisms underlying the protection afforded by moderate alcohol intake are still not understood, although higher levels of high density lipoprotein cholesterol and adiponectin and lower levels of fibrinogen (Brien et al., 2011) have been proposed.

Stroke

The risk for hemorrhagic stroke, which comprises a small minority of all strokes, is modestly increased by alcohol abuse (Higashiyama et al., 2013; Movva and Figueredo, 2013), possibly caused by the inhibitory effects of high alcohol concentrations on blood coagulation and possibly by an increase in blood pressure associated with binge drinking. By contrast, moderate alcohol consumption significantly reduced the incidence of ischemic stroke (Jimenez et al., 2012; Movva and Figueredo, 2013), which is the major cause of the disorder and is related to occlusive atherosclerosis, as in coronary heart disease. The same considerations apply to peripheral vascular disease (Movva and Figueredo, 2013).

Osteoporosis

Osteoporosis, usually measured by bone mineral density, is particularly frequent in postmenopausal women. Light to moderate alcohol ingestion has been demonstrated to...
improve bone mineral density and lower the risk of bone fractures (Berg et al., 2008; McLernon et al., 2012; Sommer et al., 2013; Tucker, 2009), and lower biochemical markers of bone turnover in postmenopausal women (Marrone et al., 2012).

DIABETES

Diabetes, type II, that is, the variety that is nonimmunologic and usually develops in adults, has been increasing in frequency and is often associated with obesity and metabolic syndrome. The incidence of this condition has been shown to be reduced by light to moderate alcohol intake (Cullman et al., 2012; Djousse et al., 2007; Heianza et al., 2013; Howard et al., 2004; Joosten et al., 2010). In persons with diabetes type II, the incidence or progression of chronic kidney disease is also reduced (Dunkler et al., 2013). As in other beneficial effects of moderate alcohol consumption, the precise mechanism underlying this relationship has not been defined; moderate alcohol consumption has a beneficial effect on glycemic control, with lower A1C levels that may translate into a lower risk of complications of diabetes (Ahmed et al., 2008). Up to 2 drinks a day had a beneficial effect on both insulin concentrations and insulin sensitivity in nondiabetic postmenopausal women (Davies et al., 2002).

RHEUMATOID ARTHRITIS

The incidence of rheumatoid arthritis, particularly in women, is reduced by moderate alcohol intake (Di Giuseppe et al., 2012; Kallberg et al., 2009; Lahiri et al., 2013), and in patients with this disorder, symptoms were ameliorated by alcohol consumption (Bergman et al., 2013).

OBESITY

Compared to nondrinkers, women who were initially of normal weight and who consumed light to moderate amount of alcohol gained less weight and had a lower risk of becoming obese during 13 years of follow-up (Thomson et al., 2012; Wang et al., 2010). This effect may be related, at least in part, to the lower incidence of diabetes Type II.

DEMENTIA

There is currently no definitive consensus regarding lifestyle modification in the prevention of or delay in reduced cognition. However, a number of interesting studies have indicated a beneficial effect of light to moderate alcohol consumption, regardless of the type of beverage, on incident dementia and the development of Alzheimer disease (Anstey et al., 2009; Letenneur, 2004; Neafsey and Collins, 2011; Solfrizzi et al., 2011; Weyerer et al., 2011). Alzheimer disease features the accumulation of a specific form of amyloid, and experimentally, EtOH in vitro protects cells against the formation of stable multimers of amyloid molecules (Ormeno et al., 2013).

CANCER

Perhaps the most widely disseminated warnings about alcohol consumption relate to its putative relationship to breast cancer. However, the risk associated with moderate consumption by women, defined as 1 drink a day, is not well established, a topic discussed in a recent review (Brooks and Zakhari, 2013). Regular alcohol consumption was not associated with an increased risk of recurrence in women who have been previously diagnosed with breast cancer (Flatt et al., 2010; Kwan et al., 2013). With respect to cancers of the esophagus and oropharynx, an elevated risk associated with alcohol consumption is confounded by smoking and infection with human papilloma virus, and has been found only at higher levels of drinking. In the United States and Western Europe, the majority of esophageal cancers are now adenocarcinomas. Moderate alcohol consumption has not been associated with an elevated risk for this tumor and has actually been reported to decrease its incidence (Anderson et al., 2009; El-Serag and Lagergren, 2009). In any event, there is evidence that all cause cancer mortality is not increased by light to moderate alcohol ingestion.

CONCLUSION

The strongest evidence for a beneficial effect of moderate alcohol intake is the documented reduction in all cause mortality and cardiovascular disease. Indeed, the protection against coronary artery disease is comparable to that produced by the administration of statins. In this context, alcoholic beverages do not require a prescription, are far cheaper, and are certainly more enjoyable. Although a physician’s advice to a patient should always be individualized, including a consideration of a person’s genetic background, the overwhelming evidence suggests that physicians should counsel lifelong nondrinkers at about 40 to 50 years of age to relax and take a drink a day, preferably with dinner. The “black swan” predicts that the risk/benefit ratio is highly favorable.

REFERENCES


