

Prevalence of diabetes mellitus

Introduction

Diabetes mellitus is a frequently occurring, chronic metabolic disease in which the regulation of the blood glucose level is impaired. Due to limited insulin action (insulin resistance) or insulin production glucose can no longer be absorbed from the blood into the cells of the body. The consequence is chronically increased blood glucose concentrations which - if left untreated - can result in damage to blood vessels and nerves. This increases the risk of comorbidities and complications such as myocardial infarction, stroke, renal dysfunction, retinal damage and diabetic foot syndrome (American Diabetes Association 2012; Chen, Magliano, Zimmet 2012). Diabetes mellitus leads to limitations in quality of life and in life expectancy (Schunk et al. 2012; Paprott et al. 2015). The disease causes high direct and indirect costs for the healthcare system (Koster, Schubert, Huppertz 2012).

The most important forms of diabetes mellitus are type 1, type 2 and gestational diabetes. Type 1 diabetes is an autoimmune disorder primarily occurring during childhood and adolescence. In contrast, older adults are predominantly affected by the most common form of the disease - type 2 diabetes. Risk factors of type 2 diabetes - in addition to a genetic predisposition - are in particular, an unhealthy diet, a lack of physical exercise and the resultant overweight. Gestational diabetes mainly only exists during the pregnancy period, however, it increases the risk of developing type 2 diabetes later in life (Feig et al. 2008).

Indicator

In the 'German Health Interview and Examination Survey for Adults' (DEGS1), the lifetime prevalence of known (physician-diagnosed) diabetes mellitus was established as follows: On the one hand in a standardised computer-assisted medical interview via the question, "Has a doctor ever diagnosed you with diabetes?" and on the other hand via documentation of taking anti-diabetic drugs in the past 7 days prior to visiting the study centre.

The tables show the lifetime prevalence for diabetes mellitus among 18 to 79-year-old adults taking all disease forms into account. The results are stratified for gender, age and social status.

Key statements

- ▶ 7.2% of adults have ever been diagnosed with diabetes (7.4% of women 7.0% of men).
- ▶ Prevalence increases significantly with advancing age.
- ▶ Diabetes mellitus is diagnosed significantly more often in people of low social status than in those of medium or high social status.

Conclusion

In DEGS1, the lifetime prevalence of known diabetes mellitus is 7.2% (7.4% of women; 7.0% of men). This corresponds to approximately 4.6 million affected persons in the 18 to 79-year-old population in Germany (Heidemann et al. 2013). Prevalence increases with age. Although it is still lower than 5% in the under 50-year-old age group it increases in the 60 to 69-year-old age group to 13.8% and to just under 22% among 70 to 79-year-olds.

Compared to DEGS1, a slightly higher lifetime prevalence was observed in the 2012 Robert Koch Institute (RKI) 'German Health Update' (GEDA) telephone survey (RKI 2012). Here around 8.9% of those surveyed (9.0% of the women, 8.7% of the men) stated that they had ever been diagnosed with diabetes mellitus. The difference can presumably be attributed to the different sampling methods (sample of local population registries vs. sample of private households available through landline telephone) and survey methods (personal medical interview vs. telephone interview) as well as to the differences in the age structures of the two surveys. Whilst in DEGS1 the data of persons aged between 18 and 79 years was analysed, the evaluation of the GEDA study also includes people aged 80 years and above.

Statements regarding the temporal development in the prevalence of diabetes in Germany can be made by comparing DEGS1 with its predecessor study the 'German National Health Interview and Examination Survey' (GNHIES98). Given simultaneous consideration of self-reported diagnosis and of laboratory data, the lifetime prevalence of diagnosed diabetes in the GNHIES98 study was 5.0% (5.6% after standardisa-

tion of the GNHIES98 data to the altered age structure at the time of the DEGS1 study period) (Heidemann et al. 2015). The prevalence of known diabetes has thus increased since 1998. Approximately one third of this increase is to be attributed to the ageing of the population (Heidemann et al. 2013). Other reasons may be earlier detection and partially improved care of adults with diabetes mellitus after introduction of the Disease Management Programme in the period between the two health surveys (Heidemann et al. 2015; Du et al. 2015; Fuchs et al. 2014). In addition, changes in the diagnostic criteria for diabetes mellitus presumably also play a role (WHO 1999; Kerner, Brückel 2010).

In addition to known diabetes mellitus, recording undiagnosed (untreated) diabetes is also important in order not to underestimate the total prevalence of the disease in the population-based studies (Heidemann et al. 2013). Undiagnosed diabetes can be determined using blood samples in which glycated haemoglobin (HbA1c) or serum glucose is measured. Evaluations of the DEGS1 study show that the prevalence of undiagnosed diabetes in Germany in recent years has fallen from 3.4% (or 3.8% when aged standardised) to 2.0% (Heidemann et al. 2015). This could be indicative of the fact that early detection of the disease has improved.

Furthermore, the DEGS1 data show that diabetes mellitus is diagnosed significantly more often in people of low social status than in those of higher social status. This applies to undiagnosed as well as diagnosed diabetes, although according to current results social inequality has not increased further (Heidemann et al. 2015).

In summary, diabetes mellitus is a disease which occurs frequently in the German population and which is associated with enormous individual and socio-economic stressors. Basic prevention and care measures are avoiding the development of type 2 diabetes risk factors, early detection of the disease and avoiding the occurrence of diabetic complications and secondary diseases.

In order to create continuous national diabetes reporting and a comprehensive, data-driven decision-making basis for health policy, a 'National Diabetes Surveillance' system is being established at the RKI. RKI primary data as well as secondary data will be integrated in this surveillance system. For more information about this project see www.rki.de.

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Note: A detailed description of the study as well as explanations on the method are available on the DEGS study website, www.degs-studie.de, and in Scheidt-Nave et al. (2012).

Further results regarding diabetes mellitus in adults can be found at Heidemann et al. (2013), Heidemann et al. (2015) and Du et al. (2015).

Table 1
Lifetime prevalence of diagnosed diabetes mellitus in 18 to 79-year-old women according to age and social status

	Lifetime prevalence of diagnosed diabetes mellitus	
	%	(95%-CI)
Women	7.4	(6.5 – 8.5)
Age		
18–39 Years	3.7	(2.5 – 5.5)
40–49 Years	4.5	(3.0 – 6.8)
50–59 Years	4.0	(2.6 – 6.0)
60–69 Years	10.7	(8.2 – 13.8)
70–79 Years	21.8	(17.6–26.7)
Social status		
Low	11.6	(8.6 – 15.5)
Middle	7.4	(6.3 – 8.7)
High	3.0	(2.0 – 4.5)
Total (women and men)	7.2	(6.5 – 8.0)

Table 2
Lifetime prevalence of diagnosed diabetes mellitus in 18 to 79-year-old men according to age and social status

	Lifetime prevalence of diagnosed diabetes mellitus	
	%	(95%-CI)
Men	7.0	(6.0 – 8.1)
Age		
18–39 Years	0.9	(0.3 – 2.3)
40–49 Years	2.0	(1.1 – 3.7)
50–59 Years	7.3	(5.3 – 10.1)
60–69 Years	17.0	(13.1 – 21.7)
70–79 Years	22.0	(17.6–27.2)
Social status		
Low	10.1	(7.5 – 13.5)
Middle	6.1	(5.1 – 7.4)
High	6.2	(4.6 – 8.3)
Total (women and men)	7.2	(6.5 – 8.0)

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