Colorectal high-grade adenomas: incidence, localization and adenoma-adenocarcinoma ratio in a retrospective and comparative population-based study of 225 consecutive cases between 1988 and 1996

Abstract Colorectal high-grade adenomas can be regarded as precancerous lesions. This study collected epidemiological data from a defined region (Luxembourg) that can serve as reference data for designing a national screening program for early colorectal cancer detection. Nine pathologists diagnosed and reviewed slides retrospectively from 288 new colorectal and anal in situ carcinomas from the period 1988–1996 (63 were excluded for various reasons). In all, 225 new colorectal high-grade adenomas were considered. There were 129 men (57%) and 96 women (42%), and 78% of patients were aged over 60 years. Over this period we found an increase in incidence of high-grade colorectal adenomas (11 cases in 1988, 40 cases in 1996) for both sexes. The overall incidence rate was 2.9×100,000 in 1988 and 9.6×100,000 in 1996. The average annual age-standardized incidence rate for this period was 3.7±0.5 (95% confidence interval); the cumulative rate (0–74 years) was 0.4%. Three-fourths of the adenomas were situated in the rectum (n=78, 35%) or sigmoid colon (n=92, 41%). Histological diagnosis was provided by 160 total polypectomy specimens (71%), 30 surgical resections (13.3%), and 35 biopsy specimens (16%). Over the study period there was an increased incidence of new colorectal adenocarcinomas. There were eight times as many adenocarcinomas (n=1782) as adenomas (n=225); the distribution of anatomical sites was comparable. These epidemiological data on 225 new colorectal high-grade adenomas can be the basis for quality assurance in clinical and histological diagnostic procedures, especially in regard to the 1:8 ratio between high-grade adenomas and invasive adenocarcinomas and may provide additional data for the design of a regional or national colorectal cancer screening program.

Keywords Colorectal high-grade adenomas · Population based data · Epidemiology · Prevention · Quality assurance

Introduction

The World Health Organization (WHO) [1] classification divides colorectal tumors into four major groups: neoplastic benign and malignant lesions, and those of epithelial and mesenchymal origin. Adenomatous proliferations were long considered as premalignant lesions. New interest in public health issues such as early diagnosis of premalignant lesions led us to evaluate the incidence of high-grade adenomas (i.e., adenomas with severe atypia or severe dysplasia) in the overall population of Luxembourg during the period 1988–1996 according to anatomical site, sex, and age of the patients and especially the ratio adenoma/adenocarcinoma over this period.
Patients and methods

Between 1988 and 1996 the Morphological Tumor Registry (MTR) in Luxembourg registered 225 new cases of adenomas with severe dysplasia of the colon and the rectum from a population increasing from 374,900 in 1988 to 418,300 in 1996 (average increase of 1.4% per year) [2]. The official registration of carcinomas in situ of the colorectum, as with those of other organs, is mandatory. In this study nine pathologists reviewed the slides of 288 new cases of cancer in situ involving patients of all nationality living in Luxembourg. Only new primary tumors were considered; exclusion criteria were recurrent disease, synchronous or metachronous adenomas, epidermoid tumors in situ secondary to condylomas at the anorectal junction, adenomatous proliferations in marginal zones of invasive adenocarcinomas, and adenomas with severe dysplasia presenting as recurrent invasive disease within 2 years at the same site. There were 129 men (57%) and 96 women (42%), and 78% of patients were aged over 60 years.

For histopathological diagnosis the permanent-section slides were reviewed by one of the authors (S.R.) to confirm diagnostic accuracy. In accord with the WHO [1] definition, high-grade adenomas had to exhibit intraepithelial or intramucosal epithelial changes with various grades of dysplasia and at least one severely dysplastic area showing proliferating crypts giving rise to complex epithelial structures with multiple lumina (cribriform patterns or back-to-back glands). The atypical crypts had to be bordered by cells with enlarged, hyperchromatic nuclei with often a prominent nucleolus, and a scanty cytoplasm without mucus production.

The data were evaluated by statistical methods as described by Boyle et al. [3]

Results

The unequivocal histological diagnosis of the 225 cases of adenomas with severe dysplasia was provided from 160 total polypectomy specimens (71.1%), 30 surgical resections of the colon or rectum (13.3%) with or without synchronous invasive adenocarcinoma, and 35 small samples obtained by biopsy (15.6%). Figures 1 and 2 demonstrate an increase in the number of adenomas and the annual crude incidence rates during the period 1988–1996. Figure 3 shows the distribution according to age groups. Three-fourths of these adenomas with severe dysplasia (n=170, 75.6%) were located in the rectum (n=78, 34.7%) or sigmoid colon (n=92, 40.9%), and the remaining cases (n=38, 16.8%) were in the colon, except for 17 cases (7.6%) in which the precise anatomical site had not been indicated by the clinician (Fig. 4). Figures 4 and 5 compare the number of new cases of adenomas with severe dysplasias (n=225) and the new cases of invasive adenocarcinomas of the colon and rectum (n=1782).

Table 1 presents the incidence, average annual all-age crude incidence rate (CR) and the average annual (European plus world population, defined by Doll et al. [4]) age-standardized incidence rates (ASR/E+ASR/W per 100,000) of colorectal high-grade adenomas in Luxembourg over the period 1988–1996. The age-standardized (world population) incidence rate [ASR/W±Za/2×S.E. (ASR/W)] of colorectal high-grade adenomas is 3.7±0.5 (3.2–4.2); the