Colorectal polyps and cancers diagnosed by pathologists in Ile de France Region

Crisapif-Petri Study

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Summary

Objectives — The aim of this study was to evaluate the histological characteristics of adenomatous polyps (AP), non adenomatous polyps (NAP), and colorectal cancers (CRC) diagnosed in the greater Paris area.

Material and methods — Pathologists filled out an identification and histological questionnaire for each biopsy or surgical specimen received between 20/09/02 and 20/12/02, which had at least one adenomatous polyp or CRC, taken from a patient of the greater Paris area.

Results — The participation rate of pathologists was 73.3% and 10 396 patients with 16 681 lesions were included. Lesions consisted in 1 223 CRC among 1 107 patients, 9 280 AP and 6 178 NAP. Mean age of patients with CRC was 68 years, with at least one AP without CRC 62 years, and with at least one NAP without CRC or AP 58 years. The mean number of polyps per patient was 1.4, and increased with age. Average size of AP was larger than that of NAP and the size increased with age for AP but not NAP. pTNM staging of CRC was: pT0, 1% pT1, 4% pT2, 13% pT3, 63% pT4, 19% N0, 55% N1, 24% N2, 19% Nx, 2%.

Conclusion — This study provides detailed data on colorectal polyps and colorectal cancers in the greater Paris region, which does not have a cancer registry. Repeated surveys could be helpful for evaluating the efficacy of screening programs in the general population.

Introduction

Colorectal cancer (CRC) is a frequent and serious disease. In France, it accounts for 15% of all cases of cancer with an estimated 36 250 new cases in 2000 [1]. CRC is the third leading cause of death in men, after prostate and lung cancer, and the second leading cancer in women, after breast cancer. The five-year survival rate is close to 65% [2]. CRC caused about 16 000 deaths in France in 2000 [1]. The incidence of CRC has increased steadily since 1985, especially for tumors located in the ascending colon [1-3]. Nearly all CRC are adenocarcinomas arising from the transformation of a benign adenoma, generally present in the form of a polyp. The risk of transformation of an adenoma depends on its size, the presence of a villous component, and most importantly, the degree of dysplasia [4].

The exact incidence of CRC in France is unknown. The INSERM has estimated that 68.2/100 000 men and 55.7/100 000 women had CRC in 2000 [1]. This estimate was established from data recorded in five cancer registries in administrative districts in France. The incidence in the greater Paris area (Île-de-France, which includes the city of Paris and surrounding suburbs), is unknown. The population of this region represents 20% of the French population so an estimated 7 250 new cases of CRC could be expected to develop annually.

It is even more difficult to estimate the incidence of adenomatous polyps (AP). Using published prevalence data [5], AP would...
be present in 15% of subjects aged 50-59 years and in one-third of subjects aged over 65 years. In a study reporting 16 years experience with an occult fecal blood test in the Paris area [6], the incidence of polyps was five times greater than the incidence of CRC.

Other colorectal polyps are not adenomatous tumors. Most are hyperplastic polyps whose possible relationship with CRC remains a topic of debate [7-9].

Pathologists who perform histological examination of all biopsy or resection specimens of benign or malignant tumors, could be a source of valuable information for apprehending the incidence and prevalence of colorectal polyps. In France, there are 1 505 pathologists practicing in 450 centers which collect information on tumor material observed and sampled by several thousand practitioners.

A population-based CRC screening campaign currently in progress in France uses the Hémoccult® fecal occult blood test. This campaign began in two administrative districts within the greater Paris area (Essonne and Seine Saint-Denis) in 2003 and 2005 respectively. The short-term efficacy of this campaign could be assessed by determining the number of polyps and cancers diagnosed at colonoscopy with positive histology on the biopsy or surgical specimens.

The purpose of the present work was to estimate the incidence of adenomatous polyps and colorectal cancer in the greater Paris area during a three month period and to detail characteristic features of the diagnosed lesions.

**Material and methods**

CRISAPIF is an association of pathologists operating in Ile-de-France, which includes urban and suburban districts in the greater Paris area. PETRI is a research association for cancer epidemiology in Ile-de-France. The present study protocol was developed conjointly by CRISAPIF and PETRI.

Four hundred and twenty pathologists practicing in 110 centers in Ile-de-France were informed about the study and invited to participate (information letters, telephone call, meetings). Ninety of these 110 centers had gastrointestinal care units. Endoscopists working with the participating pathologists were invited to deliver an information document to their patients. The pathologists filled out a standard information chart for each pathology specimen containing a polyp or a CRC.
The size of NAP did not vary with age (figure 2). Polyp distribution in the colon and rectum was a function of histological type (figure 3): 70% of NAP and 43% of AP were found in the rectum and sigmoid; 17% of NAP and 31% of AP in the ascending colon.

Surgical resection was used more frequently to remove CRC (57%), than forceps (33.9%) or biopsy-resection (9.1%). The very large majority of CRC (98.5%) were adenocarcinomas (table IV). The topography of the lesions differed between CRC, AP \( (P < 0.001) \) and NAP \( (P < 0.001) \); 58% of CRC were situated in the rectosigmoid area and 27% in the ascending colon (figure 3). pTNM staging of cancers diagnosed on the operative specimen was: pT0, 1% pT1, 4% pT2, 13% pT3, 63% pT4, 19% N0, 55% N1, 24% N2, 19% Nx, 2% (table V).

Discussion

Prevalence data currently available in France on benign and malignant tumours of the colon and rectum come from local registries kept in different administrative districts. There is no registry for the Paris area [1, 3]. The present work is the first to provide original data on malignant and premalignant colorectal tumors in the greater Paris area where 20% of the French population lives.

This work was a cooperative effort of several associations. In order to facilitate data collection and processing, French pathologists created in 1980 a national association for the development of cytology and pathology data processing (Association Nationale pour le développement de l'informatique en Cytologie et Anatomie Pathologique : ADICAP). To promote the use of harmonious terminology and systematic codification of lesions, ADICAP elaborated a thesaurus and a coding system called the ADICAP code which was recognized by the WHO in 1995. This thesaurus is currently used by the majority of pathologists practicing in France so that a homogeneous system is used to codify lesions. The ADICAP code was used to collect the data used in this study.

In 1990, ADICAP, an emanation of the French Society of Pathology, instituted regional centers for processing and statistical analysis of pathology data (CRISAP) which participate in a national federation. These regional centers promote the collection of pathology data, particularly regarding tumors. The Paris area center (CRISAPIF) and the association for the prevention and epidemiology of tumors in the Ile-de-France region (PETRI) developed the study protocol conjointly and specifically invited pathologists working in the Paris area to participate.

Although data collection was not exhaustive (voluntary participation), more than 70% of the pathology centers in the Paris area participated. This rate reflects the interest pathologists share in public health measures, particularly concerning serious condi-
tions such as cancer. Pathologists in the region have participated or are participating in other studies on other diseases [13-15].

The incidence of precancerous and cancerous lesions of the colon and rectum is considerable as demonstrated by the large number of histology charts collected in three months (over 10 000). Before this study, available national data was used to establish a rough estimate of the incidence and prevalence of colorectal AP in the Paris area (Table VI). The imprecision of the estimate reflected the quality of available data. Prevalence studies [2, 5] showed that polyps are present in 15% of subjects aged 50-59 years and in one-third of persons aged over 65 years, which, considering that 3 096 700 inhabitants of the Paris area are over 50 years of age would give more than 700 000 polyps. In another regional study on 16 years experience with occult fecal blood testing [6], the incidence of AP was five times greater than that of cancer, with around 36 250 cases.

The real incidence of CRC in France is unknown. Based on data from five cancer registries existing in 2000, the INSERM estimate [1] was 56/100 000 in women and 68/100 000 in men, or more than 36 000 new cases annually. The incidence is also unknown in the Paris area, but assuming that CRC has the same distribution as the population, 7 250 new cases can be expected annually (corresponding to 20% of CRC in France).

Another estimate is based on data obtained from the Cohort 94 established from registrations for long-term sick leave in the Paris area [16] probably underestimated the incidence of CRC because a certain number of persons with CRC who undergo surgical resection without other treatment (about 20%) are not reported as on long-term sick leave. Furthermore, these estimates are nearly ten years old and it is known that the incidence of CRC increased by 50% between 1980 and 2000 [1, 3], i.e. by 25% in ten years. Using the data from the Cohort 94 survey, and accepting the hypothesis of underreporting and increasing incidence, it can be estimated that the incidence of CRC in the Paris area was 4 550 cases in 2002.

Considering the INSERM mortality figures for the Paris area, (http://sc8.vesinet.inserm.fr:1080/accueil_fr.html), this area accounted for 2 419 of the 16 843 deaths caused by CRC in France in 1999. This represents 14.3% of deaths and assuming that incidence and mortality are proportional [1, 3], it can be estimated that there were 5 184 cases of CRC in this area in 1999, a figure closer to the estimate given by the “Cohort 94” survey.

Extrapolating the data collected during a three-month period by 73% of the pathology centers with gastrointestinal activity, the annual incidence of CRC in the Paris area can be estimated (table VII): 4428 patients with 4892 CRC; 25 792 patients with 37 120 AP 17 643 patients with 24 712 NAP. These results are thus comparable with the estimates for the Paris area using the Cohort 94 mortality data. They also suggest that the pathology centers which participated in this study were representative of all pathology laboratories in the region.

For this study, we did not re-read the histology slides to check the diagnosis so it would be possible that a certain percentage of polyps were misclassified between AP and NAP or between low and high grade AP. The histological diagnosis of polyps can be difficult in certain cases particularly between AP and NAP for certain “serrated” polyps including serrated adenomas, which were not specifically mentioned on the response chart because they are not listed in the ADICAP thesaurus. The debate is whether these polyps should be classed as NAP due to their serrated structure similar to hyperplastic polyps, or among AP due to their dysplastic structure. We did not address this question which had little impact on our results since serrated adenomas account for a very small proportion of colonic polyps [17]. The histological diagnosis (excepting the particular case of serrated adenomas) can thus be considered as reliable. The architectural type and the grade of dysplasia are however not perfectly reproducible parameters as has been demonstrated in several studies including a recent report from France [18]. We tried to reduce inaccuracy as much as possible by organizing a meeting before the study where the diagnostic criteria were recalled. A group of

![Fig. 2 – Mean size of polyps according to the patients’ age.](image_url)

**Taille moyenne des polypes en fonction de l’âge des malades.**

![Fig. 3 – Topography of cancers, adenomatous polyps and non adenomatous polyps.](image_url)

**Répartition topographique des cancers, des polypes adénomateux et des polypes non adénomateux.**

### Table IV. – Histological type of colorectal cancers.

<table>
<thead>
<tr>
<th>Histological type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenocarcinoma</td>
<td>1 105</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
</tr>
<tr>
<td>Epidermoid carcinoma</td>
<td>7</td>
</tr>
<tr>
<td>Carcinoid tumor</td>
<td>6</td>
</tr>
<tr>
<td>Neuroendocrine carcinoma</td>
<td>2</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>1</td>
</tr>
<tr>
<td>Other spindle-cell tumor</td>
<td>1</td>
</tr>
<tr>
<td>Unclassified malignant tumor</td>
<td>1</td>
</tr>
</tbody>
</table>
expert pathologists was also available to review the slides in difficult cases but was rarely consulted. A recent diagnostic test, organized by the colon commission of the French association of quality assurance in pathology (AFAQAP), demonstrated the high quality of diagnoses of colonic polypoid lesions established by French pathologists (see the AFAQAP web site for available results: www.afaqap.org).

This study was the first conducted in France providing a detailed description of AP (localization, size, number, histological grade, patient age) in a large population. In this series, AP accounted for 60% of polyps. This is probably slightly higher than the real percentage since a certain number of NAP are not systematically biopsied during endoscopy, especially small hyperplastic polyps of the rectum. Five percent of AP displayed high-grade dysplasia and 33.2% a villous component. The majority of the AP were rectosigmoid tumors. Patients with AP were ten years younger than their counterparts with CRC. These findings confirm the precancerous nature of AP and the very high risk of progression to cancer of large AP with a villous component.

This study is also the first to provide a description of NAP, particularly hyperplastic polyps which accounted for the majority of polyps in this group and which are generally considered as benign with no precancerous significance. In this series, polyps situated from the sigmoid colon to the rectal ampulla were more often hyperplastic polyps. Patients with NAP with no other lesion were four years younger on average than those with AP. These data raise the unresolved question of the place of NAP in the na-

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**Table V.** – Colorectal cancer staging.
Répartition par stades des cancers colorectaux.

<table>
<thead>
<tr>
<th>no (%)</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Nx</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>5 (1)</td>
<td>4 (1)</td>
<td>—</td>
<td>1 (1)</td>
</tr>
<tr>
<td>T1</td>
<td>27 (4)</td>
<td>22 (7)</td>
<td>2 (1)</td>
<td>—</td>
</tr>
<tr>
<td>T2</td>
<td>79 (13)</td>
<td>67 (21)</td>
<td>10 (7)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>T3</td>
<td>372 (63)</td>
<td>201 (62)</td>
<td>98 (68)</td>
<td>69 (61)</td>
</tr>
<tr>
<td>T4</td>
<td>110 (19)</td>
<td>32 (10)</td>
<td>35 (24)</td>
<td>41 (36)</td>
</tr>
<tr>
<td>Total</td>
<td>593</td>
<td>326</td>
<td>145</td>
<td>113</td>
</tr>
</tbody>
</table>

**Table VI.** – Estimate of the number of adenomatous polyps per year in the Paris region.
Estimation du nombre de polypes adénomateux par an en Ile de France.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Calculated from Ile de France data (INSEE 2001)</th>
<th>Expected number of polyps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated prevalence (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% 50 — 59 years</td>
<td>50-59 years: 1 324 551 persons</td>
<td>198 683</td>
</tr>
<tr>
<td>30% if ≥ 60 years</td>
<td>≥ 60 years: 1 772 165 persons</td>
<td>531 650</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 730 333</td>
</tr>
<tr>
<td>Estimated incidence (1, 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 polyps for 1 cancer</td>
<td>7 250 cancers</td>
<td>= 36 250</td>
</tr>
</tbody>
</table>

**Table VII.** – Estimate of the annual incidence of colorectal polyps and cancers in the Paris region.
Estimation de l'incidence annuelle des polypes et des cancers colorectaux en Ile de France.

<table>
<thead>
<tr>
<th></th>
<th>Number observed in 3 months</th>
<th>Extrapolation to one year (x 4)</th>
<th>Comparison with epidemiological data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal cancer</td>
<td>1 223</td>
<td>4 892</td>
<td>Not available</td>
</tr>
<tr>
<td>Patients with diagnosis of colorectal cancer</td>
<td>1 107</td>
<td>4 428</td>
<td>2 912 [16]</td>
</tr>
<tr>
<td>Adenomatous polyps</td>
<td>9 280</td>
<td>37 120</td>
<td>Not available</td>
</tr>
<tr>
<td>Patients with one or more adenomatous polyps</td>
<td>6 448</td>
<td>25 792</td>
<td>Not available</td>
</tr>
<tr>
<td>Non-adenomatous polyps</td>
<td>6 178</td>
<td>24 712</td>
<td>Not available</td>
</tr>
<tr>
<td>Patients with one or more non-adenomatous polyps</td>
<td>4 411</td>
<td>17 643</td>
<td>Not available</td>
</tr>
</tbody>
</table>
tural history of colonic lesions. Is NAP an indicator of the appearance of AP which is in turn an indicator of possible develop-
ment of cancer or is it a marker of a risk of CRC developing via another morphological and genetic pathway as suggested by a recent study [19]? In other terms, should individuals with NAP be classified at risk of developing CRC? Our study does not provide evidence to respond to this question which should be examined in cohort studies following patients with NAP and evaluating their possible extra risk for AP and/or CRC.

It is now demonstrated in several countries, including France, that screening for polyps and CRC in the general population with fecal occult blood tests enables a reduction in CRC-related mortality [20, 21]. This screening program has been initiated in 23 administrative districts in France including two in the Paris area. It will become national-based in the near future. The present work describes a polyps and CRC in the Paris area before implementation of an organized screening campaign. Repeated at regular intervals, this type of study should enable an evaluation of the impact of screening on the incidence of the different colorectal tumors and the stage of operated cancers before any mortality effect becomes observable. On review of the pTNM staging of CRC, the majority of cancers infiltrated the entire intestinal wall and thus corresponded to relatively advanced disease. This result is in agreement with available data for the Paris area from a recent survey by the insurance fund (URCAM) (www.urcamif.assurance-maladie.fr). It is hoped that the proportion of CRC operated at an early stage will increase after implementation of the screening program, as seen with specific studies on fecal occult blood testing in France [6, 21] and in other countries [22, 23]. Repeating the present study should allow the demonstration of this effect and could also help to ascertain the significance of NAP. Finally, the fact that the majority of pathologists practicing in the Paris area are implicated in this type of action suggests that it would be possible to establish epidemiological structures in this area similar to cancer registries and thus benefit from the computer data processing of the entire pathology structure, by the widespread use of the ADI-CAP thesaurus and the upcoming implantation of standardized pathology reports for tumors.

In conclusion, this study provided a very complete though non-exhaustive data set demonstrating the high frequency of colorectal polyps and cancers diagnosed by pathologists in the greater Paris area. It constitutes a database which will be useful for generalized screening for these lesions in the general population via search for fecal occult blood. Repeating this data collection will contribute to an evaluation of the efficacy of this screening campaign in the Paris area.


We thank the gastroenterologists and surgeons who sent their specimens to these pathologists after having informed their patients.

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REFERENCES


