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Progress Report

Q&A on diagnosis, screening and follow-up of colorectal neoplasia

C. Hassan [a,*], A. Laghi [b], A. Zullo [a], F. Iafrate [b], S. Morini [a]

[a] *Gastroenterology and Digestive Endoscopy Unit, "Nuovo Regina Margherita" Hospital, Via Morosini 30, 00153 Rome, Italy*
[b] *Department of Radiological Sciences, University "Polo Pontino", Rome, Italy*

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Abstract

The impressive and brisk evolution of medical science prevents many physicians from a thorough update on all the research fields. Colorectal cancer diagnosis, screening and follow-up is well known to require a multi-disciplinary approach, as it is faced by several specialties such as primary care physicians, gastroenterologists, non-gastroenterologist internists, radiologists and surgeons. To address this issue in a mutual perspective, we focused on the main points of the epidemiology, diagnosis, screening and follow-up of colorectal neoplasia by using a simple "Question & Answers" structure.

Keywords: Colorectal cancer; Colorectal neoplasia; Endoscopy; Epidemiology; Screening; Virtual colonoscopy

1. Introduction

The impressive and brisk evolution of medical science prevents many physicians from a thorough update on all the research fields. This will eventually result in further detaching the different specialties, with the risk of producing experts in autonomous fields, instead of physicians dedicated to different inter-related branches of the same science. From a patient's perspective, this is of paramount importance, since he/she will expect the best treatment for any disease, irrespective of the specialty of the physician. Colorectal cancer (CRC) diagnosis, screening and follow-up is well known to require a multi-disciplinary approach as it is faced by several specialties such as primary care physicians, gastroenterologists, non-gastroenterologist internists, radiologists and surgeons. Although outstanding improvements in the diagnostic techniques have been made in the past 30 years, CRC mortality is practically unchanged. This is largely related to both a scarce public awareness of CRC as a relevant health problem, and a general ignorance of the possibility to prevent CRC-associated morbidity and mortality by means of screening. To fight such a major barrier, the health organisations need to vigorously pursue the same targets so that the limited resources do not dissolve in inappropriate behaviours. For instance, radiologists performing CT colonography should be aware of the different screening intervals for people with a family history, as well as oncologists, surgeons and the same gastroenterologists should be more careful in scheduling follow-up examinations.

To prompt such a synergistic effort, a common core of scientific knowledge directed towards all the specialties is highly desirable. Unfortunately, most of the reviews on this topic are mainly dedicated to the different specialties to which each journal is specifically dedicated, preventing a thorough coalescence among all physicians. To address this issue in a mutual perspective, we chose to structure the following paper in a simple "Question & Answers" manner, with only 10 questions focusing on the main points of the epidemiology, diagnosis, screening and follow-up of colorectal neoplasia. We feel that such informations may be useful to standardise the clinical behaviour and the physician's attitude towards such a dreadful disease.

* Corresponding author. Tel.: +39 06 58446541; fax: +39 06 58446533.
E-mail address: gastroroma@virgilio.it (C. Hassan).

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2. Why is colorectal cancer (CRC) important?

Among the four most frequent malignant neoplasia in the European Union (breast, lung, prostate and colon), in the last decade CRC has become the most incident neoplasia with nearly 280,000 cases diagnosed each year [1]. Of these, 150,000 were diagnosed in men, in whom CRC ranks third after prostate and lung cancers, and 130,000 in women, in whom it is only second to breast cancer. Among the different European countries, incidence of CRC widely ranges from more than 60/100,000/year in high-risk countries such as Czech Republic, Hungary, Ireland and Slovakia to less than 25/100,000/year in low-risk areas (Greece, Macedonia). Despite these differences, CRC incidence projected from 1960 to 2006 has shown a steady increase in all the European countries, mainly because of the increase in age of the people [2,3]. In particular, in Italy, a recent estimate based on 19 general cancer registries has computed an annual percentage increase of 2.5 and 0.9 in men and women, respectively, for the period 1986–1997 [4]. Outside Europe, a brisk increase in incidence has been shown in Japan in the period 1959–1997, the age-standardised incidence rate passing from 12.3 to 76 per 100,000 [5]. It has been speculated that such a six-fold rise may be related to the westernisation of the life-style, in particular with a high-fat diet. The same trend has been identified in the developing countries of the Eastern Europe and several other Asian countries [6,7]. Such data are radically different from what has been reported in the US in the last decades. Indeed, the US long-term CRC incidence rate decreased 1.8% per year through the period 1985–1995, thereafter stabilizing through 2000 [8,9]. Although, the main causes of this Europe–US difference are unclear, a larger use of hormone replacement therapy and a more diffuse implementation of screening procedures in the US have been claimed [10].

There was a total of 139,000 deaths caused by CRC in the European Union in 2000, of which 72,000 occurred in men and 67,000 in women [1]. Trend in CRC death rate has shown a nearly 50% increase in the period 1980–2000, mainly due to the relatively higher mortality rate in the accessing countries, such that CRC has become the second leading cause of cancer-related death in European countries [6]. This is not only because of an increase in CRC incidence, but also because European average 5-year survival rate is not more than 50%. Although an improvement in the CRC 5-year survival – up to 60% – has been observed in Finland, Norway and Sweden and also in most countries of the western Europe (France, Germany, Italy, Switzerland, The Netherlands and Spain), values much below the average – between 25% and 35% – have been computed in eastern Europe (Estonia, Poland, Slovakia and Slovenia), accounting for the relatively low continental survival rate [11]. It is worth noting that a recent improvement in the 5-year survival rate has been shown in Germany when comparing the periods 1990–1992 and 2000–2002, increasing from 53% to 61%, and in France when comparing the periods 1976–1979 and 1992–1995, increasing from 33% to 55% [12,13]. This improvement has been related with a higher rate of surgical resection, an earlier diagnosis and a more intensive use of chemotherapy. A similar improvement has been described in the US in which a 5-year survival rate around 60% has been achieved. Due to the simultaneous reduction in incidence, US CRC death rate has been declining since 1980. Nevertheless, CRC still ranks third as the cause of death in both men and women in the US, being the second in North America [9].

CRC burden on society is related not only to its incidence and mortality rates, but also to its costs. It has been estimated that CRC treatment in the US costs about $45,000 per cancer [14]. When projecting such estimate on all the US population, the annual CRC-associated expenditure has been calculated to be $8.4 billion [15]. Although no available data on all the European continent has been provided, we have recently estimated the cost of CRC treatment in Italy. In detail, it was calculated at €695,818,078 for the Italian population at average risk for CRC for the 15,385 cases diagnosed without applying any screening between 2002 and 2032 [16]. Such amount of money is extremely important, because it may be diverted from the society to finance CRC screening, without requiring additional resources.

3. Are all the people at the same risk for CRC?

When facing such a widespread and silent disease, stratifying the whole population in different subgroups is extremely important. It is obvious that more sensitive and aggressive tests should be applied to the high-risk groups to minimise the potential number of false-negative results, whilst more specific and safer tests should be preferred when a low prevalence of disease is expected to avoid the possibility of false-positive results or useless complications. Age and family history are by far the most important risk factors in order to stratify CRC risk in asymptomatic people. CRC risk is extremely low in asymptomatic people younger than 40 years, being less than seven incident cases/100,000 per year [17]. Such risk is slightly increased in people aged 40–50 years – ranging from 13 to 26 cases/100,000 – although still not regarded as high enough to justify a population screening. After 50 years of age, CRC incidence rises exponentially from 50/100,000 at age 50 to 340 cases at age 80, so that screening in this "age window" is strongly advised. The importance of age 50 as screening cut-off is also strengthened when relating the prevalence of advanced adenomas, which are considered the closest precursor to colorectal malignancy, with age. Imperiale has shown a prevalence of advanced neoplasia of 3.5% (2.3% when excluding large tubular adenoma and none already harbouring a cancer) in 906 asymptomatic subjects 40–49 years of age, whilst such prevalence was 4.5% and 7.8% in those older than 50 and 60 years, respectively [18].

Although research on this field is still limited, a family history for colorectal neoplasia has been related with