

Knowledge, attitudes, and practices towards prostate cancer screening amongst men living in the southern Italian peninsula: the Prevention and Research in Oncology (PRO) non-profit Foundation experience

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Abstract

Purpose We aimed to explore the knowledge, attitudes, and practices towards prostate cancer (PCa) risk factors and prevention amongst men living in the southern Italian peninsula.

Methods We retrospectively reviewed data collected during free preventive visits carried out by the Prevention and Research in Oncology (PRO) non-profit Foundation between July 2013 and July 2016. The following data were collected: demographic and clinical features, knowledge about PCa prevention and sources of knowledge, knowledge about PCa risk factors, previous prostate-specific antigen (PSA) test, previous digital rectal examination (DRE), previous prostate ultrasound, and general attitudes towards DRE.

Results The study population consisted of 2144 Caucasian men living in four regions in the south of Italy (Campania, Calabria, Molise, Puglia). Median age was 59 years. One thousand six hundred and ninety-nine (79.2%) subjects reported knowing the existence of PCa prevention programs. Most of them received information from the media while only 17.1% declared that the information on PCa prevention that they received was from their family physicians. One thousand two hundred seventy-five (59.5%) subjects

declared knowing of the existence of PCa risk factors and 41.3% was aware of the existence of both genetic and exogenous factors. The percentage of subjects who reported having had at least one PSA test in their life was 77.8 and 55.4% reported having had a DRE.

Conclusions Knowledge about PCa screening amongst male subjects living in southern peninsular Italy is quite high. Knowledge of PCa risk factors is suboptimal and the practice of DRE is underutilized.

Keywords Digital rectal examination · Prostate cancer · Prostate-specific antigen · Screening

Introduction

Prostate cancer (PCa) is the most common non-skin cancer in elderly males in Europe [1]. In Italy, about 20% of all male cancers arise in the prostate gland [2]. Geographical variations have been described in terms of both incidence and mortality in Italy with mortality rates projected by the year 2020 higher in the southern regions [2]. To date, no definitive recommendations can be provided for primary prevention due to a lack of conclusive data [1]. PCa screening is one of the most controversial topics in urology [1]. The benefits of screening in terms of mortality were investigated in two landmark studies: the European Randomized Study of Screening for Prostate Cancer that found a substantial reduction in PCa mortality attributable to prostate-specific antigen (PSA) testing and the US-based Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial that showed no benefits after screening with PSA and digital rectal examination (DRE) [3, 4]. A living systematic review and meta-regression found a significant benefit from screening amongst trials with sufficiently long PSA screening duration [5]. Currently,

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although PCa mass screening is not indicated, opportunistic screening on an individual basis initiated by the patient and/or his physician is recommended by many authors [1]. The European Association of Urology Guidelines recommend offering an individualized risk-adapted strategy for early detection to a well-informed man with a good performance status and a life-expectancy of at least 10–15 years [1]. Knowledge towards PCa screening is a decisive factor in the adoption of proper practices [6]. Knowledge, attitudes, and magnitude of opportunistic screening vary across the world and may be influenced by socio-economic factors [7, 8]. In Italy, the practice of PCa screening has increased in recent years with variable attitudes partially responsible for the observed North–South gradient in PCa incidence and mortality [9, 10]. To date, few published data exist about knowledge, attitudes, and practices toward PCa screening in southern Italian peninsula, a geographical macro-area characterized by a lower economic level with respect to the national mean [11]. The aim of the present study was to explore knowledge, attitudes, and screening practices in relation to PCa risk factors and prevention amongst men living in southern Italian peninsula.

Materials and methods

The Prevention and Research in Oncology (PRO) non-profit Foundation was founded back in January 2011 with the aim of promoting the prevention and carrying out research in the field of oncology in Southern Italy with a special attention to PCa. Free mobile unit, walk-in preventive visits are regularly scheduled and performed by academic urologists. Males who agree to participate undergo medical history, physical exam including DRE and a questionnaire. The questionnaire consists of both open and close questions and was developed based on literature review and past experiences. It includes three sections: (1) knowledge about the existence of PCa prevention programs and risk factors, (2) practices regarding PSA test and DRE, (3) attitudes regarding DRE. Subjects who have never undergone a DRE are asked to provide a reason for that by means of an open question. Attitudes regarding DRE are investigated through the following open question “How do you judge DRE?” Furthermore, subjects are asked whether they have ever performed a prostate ultrasound and what type (suprapubic, transrectal, both). The questionnaire was pilot-tested to ensure clarity and accessibility. If PCa is suspected, patients are advised to undergo a prostate biopsy, otherwise they are instructed about recommended screening. Italy has a national health service that provides health care and universal coverage to Italians and other legal residents who have full access to health care. The service is funded by the government through taxes and any health insurance policies represent integrations that a

single citizen can take. We retrospectively reviewed data collected during preventive visits offered by the PRO non-profit Foundation between July 2013 and July 2016. Male subjects aged ≥ 18 years and living in the southern Italian peninsula were included into the study. There were not specific exclusion criteria. Demographic and clinical data as well as results from the questionnaires were collected. A positive family history of PCa was defined as at least one first- or second-degree relative affected. Men with lower urinary tract symptoms (LUTS) were defined as those experiencing at least one of the following symptoms: urgency, frequency, urgency incontinence, nocturia, slow stream, hesitancy, feeling of incomplete emptying. Men with sexual complaints were defined as those experiencing at least one of the following symptoms: premature ejaculation, erectile dysfunction, lack of sexual interest, inability to achieve orgasm. A subgroup analysis was performed according to patients' age (<40, 40–54, 55–69, >69 years). Age groups were chosen in accordance with the index patients identified by the American Urology Association (AUA) guidelines [12]. Continuous variables were expressed as mean, median, and range. Categorical variables were expressed as number and percentages.

Results

The study population consisted of 2144 Caucasian men living in four regions of the southern Italian peninsula (Campania, Calabria, Molise, Puglia). Visits were performed in 82 cities. Demographic and clinical characteristics of the subjects are listed in Table 1. Median age was 59 years and 79.0% of subjects ($n = 1695$) were aged 40–69 years. Fifty-four subjects (2.5%) were aged ≥ 80 years. Two hundred and forty-nine subjects (11.6%) had a family history of PCa.

Knowledge and practices

Knowledge and practices about PCa prevention, sources of knowledge and awareness of PCa risk factors in the overall study cohort and in the age-based subgroups are described in Table 2. One thousand six hundred and ninety-nine subjects (79.2%) received information about PCa prevention in their life and most of them by media. One thousand two hundred seventy-five subjects (59.5%) knew the existence of PCa risk factors and 41.3% ($n = 526$) were aware of the existence of both hereditary and generic factors.

Attitudes

Among the 795 subjects who had never had a DRE, 388 (48.8%) never had it because of the absence of symptoms, 26 (3.2%) were under the persuasion that PSA alone was enough and 31 (3.8%) because they considered it bothersome. After

Table 1 Demographic and clinical characteristics of the subjects ($n = 2144$)

Variable	Value
Age, years, median (range)	59 (18–94)
Age class, n (%)	
<40 year	53 (2.5)
40–54 year	725 (33.8)
55–69 year	970 (45.2)
>69 year	396 (18.5)
Ethnicity n (%)	
Caucasian	2144 (100)
Family history of PCa, n (%)	
Yes	249 (11.6)
Not	1689 (78.8)
Do not know	206 (9.6)
LUTS, n (%)	
Yes	1365 (63.7)
Not	656 (30.6)
No answer	123 (5.7)
Sexual complaints, n (%)	
Yes	444 (20.7)
Not	1286 (60)
No answer	414 (19.3)

LUTS lower urinary tract symptoms, PCa prostate cancer

the DRE, 47.2% of the subjects ($n = 1014$) judged it invasive but necessary, 36.8% ($n = 788$) an examination like any other, 2.3% ($n = 49$) bothersome and unnecessary, 1.1% ($n = 24$) a violation of their masculinity, and 12.5% ($n = 269$) did not provided any answer.

Prostate ultrasound

One thousand and eighty-five subjects (50.6%) had undergone a prostate ultrasound in their lives, 934 (43.6%) had never had one and 125 (5.8%) did not provide an answer. Only 16.1% of subjects who had undergone a prostate ultrasound received a trans-rectal approach.

Discussion

Current treatments for PCa are a source of morbidity and the decision to screen, diagnose and treat PCa should be carefully individualized [13–15]. Most guidelines recommend offering PCa screening beginning at age 50 or earlier in the presence of risk factors, and to only perform screening if the patient's life expectancy is at least 10 years [16]. Some authors recommend routine screening beginning at age 40 to establish a baseline risk of subsequent cancer [17]. The AUA guidelines recommend against screening in men aged

<40 years, do not recommend routine screening in men aged 40–54 years at average risk, strongly recommend screening in men aged 55–69 years, and do not recommend routine PSA screening in men aged >70 years [12]. Screening should be based on a shared decision-making process between physicians and patients. Therefore, risk awareness, knowledge of screening protocols, and interaction with healthcare providers are a prerequisite for a conscious choice about screening. Epidemiological studies have shown strong evidence in favor of a genetic predisposition to PCa, with racial/ethnic background and family history being the most important factors [1]. Exogenous factors affect the risk of progression from latent to clinical PCa. Although 59.5% of subjects in the present study declared to be informed about the existence of PCa risk factors, the level of knowledge was suboptimal as only 24.53% knew about the existence of both genetic/hereditary and exogenous factors with small differences according to age groups. Other studies found a fairly good knowledge about PCa risk factors [18, 19]. Steele et al. reported that many men aged ≥ 50 years living in New York State were misinformed about their PCa risk [19]. Interestingly, we found that the percentage of subjects informed about the existence of PCa risk factors declined with increasing age. Poor knowledge about PCa risk factors by men may lead to an underestimation of their own risk and, subsequently, may negatively affect conscious choice about screening. Most subjects in the present study declared to be informed about PCa prevention with very small differences among age groups. Interestingly, the respondents identified the media as the main source of this information and only 17.1% of subjects reported that they had received information from their family physicians. This finding is consistent with some published data. Media represent a strategic tool in the dissemination of health information [18]. Currently, public knowledge and information on cancer prevention is largely influenced by media rather than by health professionals [18]. In a study by Nakandi et al., only 12.3% of subjects residing in Uganda reported that their physician had advised them to undergo PCa screening [20]. The association of knowledge about PCa screening with actually getting screening is not clear due to the inconsistency in the literature [18]. Although educational programs may improve overall knowledge about PCa and increase screening compliance, health care providers' attitudes toward screening is considered as a powerful factor in promoting adherence [21]. Screening methods for PCa commonly include the PSA test and DRE [22]. In Italy, the practice of PSA-based screening has increased in the past years and exposure to PSA screening in males over 50 years of age increased from 31.4% in 2002 to 46.4% in 2008 [9]. A survey published in 2004 found significant differences between geographical areas with opportunistic PSA-based screening used by 36.4% of subjects living in north regions, by 33.5% of subjects living in

Table 2 Knowledge and practices about PCa risk factors and PCa screening

	Overall	<40 year	40–54 year	55–69 year	>69 year
Knowledge					
Have you ever heard about PCa prevention?					
Yes, <i>n</i> (%)	1699 (79.2)	43 (81)	578 (79.7)	772 (79.6)	306 (77.3)
No, <i>n</i> (%)	242 (11.3)	5 (9.4)	86 (11.9)	105 (10.8)	46 (11.6)
No answer, <i>n</i> (%)	203 (9.5)	5 (9.4)	61 (8.4)	93 (9.6)	44 (11.1)
If yes, which was the source of information?					
TV, <i>n</i> (% ^a)	1054 (62.0)	30 (69.8)	330 (57.0)	478 (61.9)	216 (70.6)
Newspapers, <i>n</i> (% ^a)	544 (32.0)	16 (37.2)	178 (30.8)	243 (31.5)	107 (35.0)
Internet, <i>n</i> (% ^a)	546 (32.1)	19 (44.2)	225 (38.9)	236 (30.6)	66 (21.6)
Friends, <i>n</i> (% ^a)	476 (28.0)	13 (30.2)	162 (28.0)	215 (27.8)	86 (28.1)
Media campaign, <i>n</i> (% ^a)	407 (24.0)	8 (18.6)	160 (27.7)	184 (23.8)	55 (18.0)
Family physicians, <i>n</i> (% ^a)	290 (17.1)	4 (9.3)	96 (16.6)	130 (16.8)	60 (19.6)
No answer, <i>n</i> (% ^a)	21 (1.2)	0 (0)	6 (1)	12 (1.6)	3 (1)
Do you know PCa risk factors?					
Yes, <i>n</i> (%)	1275 (59.5)	35 (66)	448 (61.8)	580 (59.8)	212 (53.5)
No, <i>n</i> (%)	633 (29.5)	12 (22.6)	204 (28.1)	282 (29.1)	135 (34.1)
No answer, <i>n</i> (%)	236 (11.0)	6 (11.3)	73 (10.1)	108 (11.1)	49 (12.4)
Which risk factors do you know?					
Hereditary/genetics, <i>n</i> (% ^b)	392 (30.7)	14 (40)	140 (31.3)	186 (32.1)	52 (24.5)
Environmental, <i>n</i> (% ^b)	317 (24.9)	8 (22.9)	100 (22.3)	135 (23.3)	74 (34.9)
Hereditary/genetics + environmental, <i>n</i> (% ^b)	526 (41.3)	13 (37.1)	198 (44.2)	236 (40.7)	79 (37.3)
No answer, <i>n</i> (% ^b)	40 (3.1)	0 (0)	10 (2.2)	23 (4)	7 (3.3)
Practices					
Have you ever undergone a PSA?					
Yes, <i>n</i> (%)	1668 (77.8)	13 (24.5)	476 (65.7)	821 (84.6)	358 (90.4)
Not, <i>n</i> (%)	441 (20.6)	37 (69.8)	235 (32.4)	137 (14.1)	32 (8.1)
No answer, <i>n</i> (%)	35 (1.6)	3 (5.7)	14 (1.9)	12 (1.2)	6 (1.5)
Have you ever undergone a DRE?					
Yes, <i>n</i> (%)	1187 (55.4)	19 (35.8)	305 (42.1)	570 (58.8)	293 (74.0)
Not, <i>n</i> (%)	795 (37)	29 (54.7)	370 (51)	329 (33.9)	67 (17)
No answer, <i>n</i> (%)	162 (7.6)	5 (9.4)	50 (6.9)	71 (7.3)	36 (9.1)

The percentages refer to the total number of subjects within each age category

DRE digital rectal examination, PSA prostate specific antigen

^a Percentage of subjects who answered “yes” at the question “Have you ever heard about PCa prevention?”

^b Percentage of subjects who answered “yes” at the question “Do you know PCa risk factors?”

the central regions, and by 22.9% of subjects living in the south regions and islands [23]. In the present study, 1665 subjects aged >40 years (79.6%) had undergone PSA test in their lives. Interestingly, 13 subjects aged <40 years (24.5%) had undergone a PSA test. PSA testing is not routinely performed in young men [24]. Few studies have evaluated the incidence of PCa in men aged <40 years. In a study by Yang et al., the incidence of PCa in men aged <40 years with increased PSA levels was only 1.3% [24]. Positive predictive values for the PSA test range from 32 to 49% and it improves when the PSA test is combined with DRE [19]. DRE is regarded as a basic tool for screening and early detection of PCa and is estimated to have an overall accuracy of about

59% [25]. Despite its poor sensitivity, DRE is a relatively inexpensive procedure that may detect cancers missed by other tests and can be used to investigate other abnormal prostate conditions [25]. Consequently, multiple guidelines recommend combining PSA and DRE for screening [15]. In the present study, only 1168 subjects aged >40 years (55.8%) declared to have undergone a DRE during their life. Tolerance to DRE is a matter of debate. Although some authors consider DRE a well-tolerated exam, in some studies it represented a significant barrier to participation in PCa screening thus suggesting an increased participation rate to PSA-alone screening [25, 26]. Interestingly, most subjects in the present study showed a good attitude toward DRE. Indeed,

36.8% of subjects judged the DRE an examination like any other and 47.2% judged it necessary although invasive. Of note, we found that the percentage of subjects declaring to have undergone PSA testing or DRE increased with age and was particularly high among subjects aged >69 years. Based on present data, we cannot provide an exhaustive explanation for this observation. However, we can hypothesize that older subjects undergo urologic evaluation more frequently than younger ones often due to reasons other than PCa screening, for instance LUTS management, and thus are more exposed to receive both DRE and PSA test. Life expectancy rather than chronological age should be considered to stop screening and the decision becomes increasingly challenging with increasing age. Bynum et al. found a rate of PSA screening of 17.2% in men aged ≥ 80 years, with wide variations across United States regions (<2–38%) [27]. Given the low number of subjects aged ≥ 80 years in the present series, we cannot provide conclusive data about subjects in this age-range. The role of prostate ultrasound for PCa screening is a matter of debate and to date there are no clear indications in this setting. According to some evidence, however, the positive predictive values for both PSA and DRE improve when the tests are combined or if either test is performed in conjunction with transrectal ultrasound [19]. Moreover, it can reduce the number of missed cancers and unnecessary biopsies by effective targeting of biopsies [28]. The percentage of subjects in the present study who declared to have received a transrectal prostate ultrasound in their life was low. Multiparametric magnetic resonance imaging (mpMRI) has gained popularity as a useful tool in the diagnostic work-up of PCa. Current guidelines, however, recommend mpMRI when clinical suspicion of PCa persists despite negative biopsies [1]. Some evidences failed to show benefits from this imaging modality, also when compared to transrectal approach, in the setting of biopsy naïve patients [29, 30]. Moreover, high costs and limited availability discourage the use of mpMRI in the context of screening. Our results have relevant clinical implications. Efforts should be made to check and eventually improve the level of knowledge about PCa risk factors and screening programs among men living in southern Italian peninsula. Subjects who agree to adhere to a screening program should be adequately informed about the optimal starting and stopping ages of screening as well as about the role of both PSA testing and DRE. We are aware, however, of the major limit of the present study which is its retrospective design. Moreover, the subjects have been identified from a database of males who spontaneously approached prevention program clinic and therefore may be not representative of the overall population of male subjects living in southern peninsular Italy. Furthermore, we are aware that the context of a mobile unit may be not comfortable for some men and this may limit the capability of subjects to provide exhaustive answers. Finally, the

study does not provide information about the adherence of subjects to regular screening evaluations. Consequently, these data deserve confirmation in further prospective studies.

Conclusions

Results from the present preliminary study suggest that a high percentage of male subjects living in southern Italian peninsula and interested in PCa prevention are informed about the existence of PCa prevention programs and that media represent the main contributor to this knowledge. However, knowledge of PCa risk factors is suboptimal, as only a small proportion of subjects know the existence of both genetic/hereditary and exogenous factors. Finally, although most subjects undergo a PSA testing, a lower percentage of them receive a DRE.

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Compliance with ethical standards

Conflict of interest The mobile walk-in cancer-screening clinic is funded and supported by the PRO non-profit Foundation. Vincenzo Mirone is the President of the PRO non-profit Foundation; Ciro Imbimbo is a Member of the Executive Committee of the PRO non-profit Foundation; Paolo Verze is a Member of the Scientific Committee of the PRO non-profit Foundation.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For this type of study, formal consent is not required.

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