Evolution of primary care referrals to urology. Impact of a protocol on prostate disease and continuing education

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Abstract

Objective: To analyze the evolution of primary care referrals to the Urology Department after the implementation of a joint protocol on prostate disease and a continuing education program in our healthcare area.

Material and methods: In January 2011, we launched an action protocol on prostate disease, which was complemented by training sessions and an e-mail-based consultation system. We analyzed primary care referrals to the Urology Department between 2011 and 2013 and determined the reasons for the consultations and the compliance with the established criteria on prostate disease. We obtained data from the “Request for Appointment in Specialized Care” program of the Community of Madrid. We calculated the sample size with a 95% confidence level and a 50% heterogeneity.

Results: A total of 19,048 referrals were conducted. The most common reason for the referrals was lower urinary tract symptoms associated with benign prostate hyperplasia, with a 27% reduction and a compliance that went from 46% at 67%. Although prostate-specific antigen consultations increased by 40%, they improved their appropriateness (from 55% to 72%). This was the main type of consultation for suspicion of malignancy (30%). Also worth mentioning were female incontinence, which doubled in number, and a 41% reduction in erectile dysfunction, which could be due to the primary care training.

Conclusions: The collaboration between the Department of Urology and primary care succeeded in improving the appropriateness of prostate disease referrals and modified the tendency to refer the rest of the diseases included in the project.

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PALABRAS CLAVE
Hiperplasia prostática benigna; PSA; Atención primaria

Evolución de las derivaciones de atención primaria a urología. Impacto de un protocolo en enfermedad prostática y de formación continuada

Resumen

Objetivo: Analizar la evolución de las derivaciones desde atención primaria (AP) a urología tras implantar un protocolo conjunto en enfermedad prostática y un programa de formación continuada en nuestra área sanitaria.

Material y métodos: En enero de 2011 iniciamos un protocolo de actuación en enfermedad prostática, que se complementó con sesiones formativas y con un sistema de consultas vía correo electrónico. Analizamos las derivaciones desde AP a urología entre 2011 y 2013, determinando el motivo de consulta y la adecuación a los criterios establecidos en enfermedad prostática. Obtuvimos los datos del programa «Solicitud de cita en atención especializada» de la Comunidad de Madrid. Calculamos el tamaño muestral con un nivel de confianza del 95% y heterogeneidad del 50%.

Resultados: Se produjeron 19.048 derivaciones. El motivo de consulta más frecuente fue STUI asociado a HBP, con una reducción del 27% y una adecuación que pasó del 46 al 67%. Las consultas por PSA, aunque aumentaron un 40%, también mejoraron su adecuación (del 55 al 72%), siendo la principal consulta por sospecha de malignidad (30%). Destacan además la incontinencia femenina, que ha duplicado su número, y el descenso del 41% en disfunción eréctil, que pueden justificarse por la formación impartida a AP.

Conclusiones: La colaboración entre urología y AP consigue mejorar la adecuación de las derivaciones en enfermedad prostática y modificar la tendencia de derivación del resto de enfermedades incluidas en el proyecto.

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Introduction

Collaboration between primary care (PC) and specialized care (SC) is essential in the management of numerous diseases. Diagnostic, treatment and follow-up tasks can be improved. Urological conditions account for a significant number of PC visits. Among these, lower urinary tract symptomatology (LUTS) associated with benign prostatic hyperplasia (BPH) is the main reason for consultation at health centers (HCs) and at specialized care centers. Likewise, there is a growing demand for PSA determination, such as prostate cancer screening, the interpretation of which might constitute a problem at PC consultations.

Many patients with LUTS can be managed by PC physicians if they undergo proper training. Those requiring referral to SC may be pre-evaluated through PSA, digital rectal examination, IPSS score, thus optimizing their first visit to the urologist.\(^1,3\)

In January 2011, we started a collaborative project between PC and urology in the area of health at the 12 de Octubre Hospital (Madrid, Spain), including the HCs corresponding to 3 peripheral specialties centers (PSCs). We developed action plans for LUTS associated with BPH and for PSA management, training sessions on the most relevant urological conditions, and an e-mail system as a two-way communication method.\(^1\) The initial assessment of this procedure achieved good results. We improved the adequacy of referrals due to prostate disease, thus reducing the referral rate.

3 years after the implementation of this protocol, we assessed its impact through the analysis of referral causes and, in the case of prostate disease, the adequacy to the criteria established for symptomatology associated with BPH and PSA management. With these results, we aimed to determine new action targets in order to improve care of urological patients at HCs and PSCs.

Methods and materials

Population and research tools

We conducted a retrospective, observational study to assess the referrals made from the PC physician to urology between January 2001 and December 2013.

The population under study belonged to the former area of health of the 12 de Octubre Hospital, spread throughout 18 HCs dependent on 3 specialty centers (Carabanchel, Orcasitas and Villaverde). At the beginning of the study, the study population was comprised of 411,259 patients, but declined to 400,384 at the end of the study (2.6%).

In these HCs, the joint action project between Urology and PC was launched in January 2011 and consisted of the following: the development of protocols for the management of prostate diseases (Figs. 1 and 2), ongoing training, and e-mail communications between the PC physicians and reference urologists assigned to each PSC.\(^4\)

The training program consisted of several sessions, conducted by urologists of the Urology Service at each of the HCs, aimed at PC physicians. They explained the protocol and referral criteria in the event of prostate disease. Besides, between 2011 and 2013, 3 training courses (of 16 h each) were carried out and accredited by the Commission for Continuous Training of the Madrid regional
government. They included issues such as LUTS associated with BPH, prostate adenocarcinoma, UTI, incontinence, lithiasis, erectile dysfunction and alterations in the sexual field, and microhematuria. These were complemented by various sessions on prostate diseases, incontinence and andrology requested by HCs.

In order to maintain fast and two-way communication, e-mail correspondence was made available between PC physicians and the practicing urologist at each PSC, in order to resolve queries and comments on controversial cases.

Data collection was done using the program for specialty care appointments, introduced by the Health Council of the Madrid regional government in October 2010. This system gives you access to the information sent to the urologist by the PC physician. No patients under the age of 14 (pediatric surgery) were included.

Analysis by reason for consultation

One of the objectives was to observe the evolution of inter-consultations from HCs to urology depending on the reason for consultation. To that end, 2 evaluators were tasked with classifying referrals according to urological disease and the information available in the program for specialty care appointments, obtaining the total number and the percentage of each total.

We calculated the sample size (n) representative of each year, with a confidence level of 95%, and a level of heterogeneity of 50%. The n obtained was 391 for 2011, 377 for 2012 and 386 for 2013.

In order to homogenize the sample and avoid seasonal biases, we analyzed the same number of patients per month, selecting the first monthly applications received.

We excluded those referrals with a blank information field (no information in the program for specialty care appointments), its classification by disease being therefore impossible. These losses accounted for 1.9% of the total, and, in order to minimize their negative effect on the results, were replaced by the immediately following application.

As a secondary aim, all those inter-consultations labeled as suspicious for malignancy (SM) were identified and classified by disease.

Analysis by adequacy to protocols

The total number of referrals due to LUTS associated with BPH and PSA management was calculated by annual estimation on the basis of the results of the analysis by reason for consultation.

For assessing the adequacy of referrals to the protocol, we followed a similar methodology, using the program for specialty care appointments and calculating a new sample size (confidence level of 95% and level of heterogeneity of
Evolution of primary care referrals to urology

50%) depending on the estimated total. Thus, the n value for consultation requests due to BPH was 305 in 2011, 274 in 2012 and 213 in 2013, and for elevated PSA 128, 187 and 245 respectively.

Two evaluators reviewed the data from the program for specialty care appointments and classified these referrals into ‘adequate’ or ‘inadequate’. Those that met the referral criteria implemented in our protocol were considered as ‘adequate’. The ‘inadequate’ ones were those where the information contained in the inter-consultation paper (taken from the program for specialty care appointments) did not meet the established criteria, or those with incomplete information or with insufficient data to justify their adequacy.

Statistical analysis

A descriptive analysis was performed using frequency calculation and by calculating referral percentages by reason for consultation and by adequacy to protocols annually (2011, 2012 and 2013). Comparison of frequencies and percentages was done using Chi-square test. SPSS software version 17 was used.

Results

A total of 19,048 referrals made over the 3 years. In 2011, there were 6339 referrals, declining to 6010 by 2012. Nonetheless, we observed an increase in 2013, reaching 6699 referrals submitted from primary care. This was an overall increase of 5% (p < 0.0001) (Table 1).

In the analysis by reason for consultation, a highlight is the decrease in requests due to LUTS associated with BPH. They decreased by 26.5% during the period studied, which represents an estimated decrease of 387 referrals. It should be noted that there was a slight increase between 2012 and 2013, although it was not statistically significant (p = 0.80) (Fig. 3).

Other significant declines in erectile dysfunction and lithiasis were observed. The number of referred patients fell in both cases, with 235 fewer patients due to erectile dysfunction and 165 due to lithiasis between 2011 and 2013.

On the contrary, certain diseases experienced significant increases. This was the case of female urinary incontinence, which with 480 more referrals stood out as the reason for consultation with the greatest increase. Next in importance were testicular conditions, with an increase of 430 estimated patients (84%) and male infertility, which increased by 172 consultations (180%).

In the analysis by adequacy to protocols, we observed a better adequacy in both LUTS associated with BPH and PSA. In the case of LUTS associated with BPH, in addition to a reduction in the number of referrals, these complied better with the protocols, rising from 46% to 67% in terms of adequacy. In the case of PSA management, their adequacy improved from 55% to 72%, despite the increase in
the number of consultations for this reason (40% more) (Fig. 4).

Referrals associated with PSA are of great relevance, since one in three patients referred to the urologist with suspected malignant disease were referred due to an elevated PSA level (31%). Other diseases referred as SM were the following: bladder neoplasia (17%), kidney tumor (14%) and testicular cancer (13%).

Discussion

It has been shown that communication between PC and SC improves patient care. However, the relationship between these 2 levels of care has not been established yet, and varies depending on each area of health. The PC physician performs a regulatory task acting as a ‘doorway’ to specialist consultations in Spain and in other European Union countries.\(^9\) Interventions on PC, through training sessions and the creation of documents concerning structured referrals, have been found to have an impact on referral rates.\(^6\) Other measures to be considered are the following: a second medical opinion at the health center and teleconsultation.\(^7\)

There have been precedents to this study with excellent outcomes. In 1998, Caballero et al. compared the referrals made by PC physicians who had been included in a collaborative program with urology (Costa del Sol Hospital), with those requested by physicians who had not been included. The results showed that those physicians with access to diagnostic and therapeutic protocols provided 29% of ‘high-quality’ consultations versus 9% in the case of those who were not familiar with the protocols.\(^8\) More recently, Páez et al. assessed the degree of adherence to a referral protocol concerning 10 urological conditions and agreed by consensus with PC services. With an initial adequacy rate of 57.2%, they reached up to 75.4% when backing up those measures with joint meetings and telephone and e-mail communication. The authors pointed out subjectivity as a constraint in the ‘adjusted to protocol or not’ classification, which was made by the urologist on patient consultation.\(^9,10\) Nonetheless, the end of the training period implied a return to initial adequacy figures, which could possibly be associated with staff turnover in PC.\(^11\)

![Figure 3](http://www.elsevier.es)  
**Figure 3** Evolution of the number of referrals in BPH, PSA, female incontinence, and erectile dysfunction between 2011 and 2013.

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**Table 1** Estimated evolution of the number of referrals by disease in absolute number and percentage.

<table>
<thead>
<tr>
<th>Disease</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>Difference</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUTS associated to BPH</td>
<td>1458</td>
<td>951</td>
<td>1071</td>
<td>−26.5%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Testicular disease</td>
<td>507</td>
<td>781</td>
<td>937</td>
<td>+84%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Erectile dysfunction</td>
<td>570</td>
<td>420</td>
<td>335</td>
<td>−41%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Female incontinence</td>
<td>190</td>
<td>360</td>
<td>670</td>
<td>+250%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Elevation of the PSA</td>
<td>190</td>
<td>240</td>
<td>267</td>
<td>+40%</td>
<td>0.002</td>
</tr>
<tr>
<td>Infertility</td>
<td>95</td>
<td>180</td>
<td>267</td>
<td>+180%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lithiasis</td>
<td>634</td>
<td>480</td>
<td>469</td>
<td>−26%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>UTI</td>
<td>634</td>
<td>540</td>
<td>602</td>
<td>−5%</td>
<td>0.048</td>
</tr>
<tr>
<td>Local surgery</td>
<td>824</td>
<td>901</td>
<td>804</td>
<td>−2.4%</td>
<td>0.085</td>
</tr>
<tr>
<td>Others</td>
<td>1236</td>
<td>1157</td>
<td>1277</td>
<td>+3%</td>
<td>0.052</td>
</tr>
<tr>
<td>Total</td>
<td>6339</td>
<td>6010</td>
<td>6699</td>
<td>+5.7%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Population</td>
<td>411,259</td>
<td>405,965</td>
<td>400,384</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparison by means of Chi Square test with statistical significance \(p < 0.005\).
Along with these previous experiences, we started out joint action protocol. Reducing the number of consultations was not among our goals, but improving their adequacy, thus offering more satisfactory care. However, that aspect was assessed in order to improve and adapt this protocol to new requirements. The overall number of referrals initially fell between 2011 and 2012, maintaining the trend already observed between 2010 and 2011. Nonetheless, there was a further increase in 2013, particularly at the expense of certain diseases. In the analysis carried out a year after the protocol had been implemented, we made a preliminary assessment by calculating referral rates, on the basis of the information provided by the admission staff. The implementation of this program for specialty care appointments has made it possible to obtain more accurate data on referrals, but it did not allow us to include 2010 in the present study, since its use started in the last quarter of that year.

As discussed earlier, the urological conditions which are most commonly referred to SC are those associated with BPH. The PC physician has the right tools to diagnose, treat and follow up the vast majority of patients. In 2009, PC scientific societies and the Spanish Association of Urology drafted a consensus document aimed at the optimal management of patients with LUTS associated with BPH. The manuscript provided unified referral criteria to urology, based on the European Association of Urology guidelines. In our study, we established this protocol with some amendments for its adaptation to our area, with fewer patients being referred due to LUTS associated with BPH and also in a more appropriate manner. The results of the initial assessment of the protocol appeared to be more positive, reaching up to 64% in terms of adequacy in just one year. However, the requirements to consider a referral as ‘adequate’ have been made more strict recently. In the baseline, adequacy was assessed by the urologist upon consultation. We have now evaluated inter-consultation forms using this program for specialty care appointments, classifying as inadequate those that were not properly filled (even if the patient did meet the criteria when evaluated by the urologist).

In the screening for prostate cancer based on PSA, we adjusted more inter-consultations to the consensual criteria, associating an increase in the number of referrals. This is justified by the growing dissemination of PSA usage and its increased use by PC physicians. As in the case of LUTS associated with BPH, we were more rigorous in accepting a referral as valid.

In addition to the development of protocols for prostate disease, a special training effort was made in the field of PC. This training did not only include LUTS associated with BPH and PSA management, but also other common urological conditions. This might be a factor explaining, at least partly, changes in the reasons for referral. Among these, a highlight was the decrease in the number of referrals due to erectile dysfunction or lithiasis. On the contrary, we observed a significant increase in female urinary incontinence, thanks to improved knowledge on the part of the AP physician.

The results of this study enable us to set new goals, such as an update of the protocols for prostate disease and their dissemination among PC physicians. Although we did observe an improvement in adequacy, a significant number of patients who could be treated at PC units are still referred. Besides, we must also take into account other factors for its evaluation, such as the level of satisfaction of PC physicians with these procedures and their economic impact.

Getting to know the most common reasons for referral within our area helps to determine other conditions which must be managed. The large amount of patients referred due to a scrotal condition, and the progressive increase in the number of cases referred due to urinary incontinence pose the need to develop new protocols, and to enhance training in these areas. These should offer the PC physician the necessary means for diagnosis and treatment, including criteria for referral to urology. As in the case of the protocols for prostate disease, an evaluation of compliance is needed on this issue, especially in terms of adequacy. To that end, involvement on the part of urologists and PC physicians is essential for drawing up and disseminating protocols.

Collaboration between healthcare levels can be improved through joint initiatives, which would include common criteria and training programs. This will improve the quality of patient care, both at the time of diagnosis and when treating their condition, thus avoiding unnecessary referrals.

**Conclusions**

The establishment of collaborative protocols between the various healthcare levels allows for better adequacy of
referrals from PC services to urology. PC training has enabled us to decrease the number of referrals made due to several conditions such as LUTS associated with BPH and erectile dysfunction. Other conditions, such as female urinary incontinence, have increased in number thanks to a greater number of diagnoses.

This study allows us to establish new action targets, both for updating the established protocols, for developing new ones, as well as for updating continuing training programs in the field of PC.

Conflict of interest

The authors declare that they have no conflict of interest.

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