DOI: 10.4081/aiua.2013.4.184

ORIGINAL PAPER

# An improvement in sexual function is related to better quality of life, regardless of urinary function improvement: Results from the IDIProst® Gold Study

**Tommaso Cai [1], Giuseppe Morgia [2], Giuseppe Carrieri [3], Carlo Terrone [4], Ciro Imbimbo [5], Paolo Verze [5], Vincenzo Mirone [5], IDIProst® Gold Study Group ***

[1] Department of Urology, Santa Chiara Regional Hospital, Trento, Italy;
[2] Department of Urology and Department of Hygiene and Public Health, University of Catania, Catania, Italy;
[3] Department of Urology and Renal Transplantation, University of Foggia, Foggia, Italy;
[4] Division of Urology, ASO Maggiore della Carità University Hospital, University of Eastern Piedmont, Novara, Italy;
[5] Department of Urology, University Federico II of Naples, Italy.

## Summary

***Objective.*** *The relationship between lower urinary tract symptoms (LUTS) and erectile dysfunction (ED) has recently received increased attention. The aim of this study was to evaluate the efficacy of the Alfa-5® association of Serenoa repens, Pinus massoniana Bark Extract (PMBE) and Crocus sativus (IDIProst® Gold) in improvement of patient's quality of life, when compared with Serenoa repens alone.*

***Materials and Methods.*** *All patients with clinical and instrumental diagnosis of LUTS due to Benign Prostatic Hyperplasia (BPH) and ED, attending 5 Italians Urological Institutions from May to December 2012 were enrolled in this prospective, multicentre, phase 3 study.*

*Participants were assigned to receive oral capsules of IDIProst® Gold (one capsule q24 h) or Serenoa repens 320 mg (one capsule q24h) for 3 months. Clinical and instrumental analyses were carried out at the enrolment and at the end of therapy. IPSS, IIEF-5 and SF-36 questionnaires have been used. The main outcome measure was the improvement of quality of life at the end of the whole study period.*

***Results.*** *129 (mean age 45-71 ± 4.36) men were randomly allocated to IDIProst® Gold (n = 83) or Serenoa repens (n = 46). The baseline questionnaire mean scores were 17.1 ± 6.4, 14.9 ± 3.7, 96.3 ± 1.2 for IPSS, IIEF-5 and SF-36, respectively. At the follow-up examination, statistically significant differences have been reported in terms of IPSS (11.9 vs 13.8; $p < 0.001$), IIEF-5 and SF-36 mean scores (19.3 vs 16.1; 99.7 vs 96.3; $p < 0.003$; $p < 0.001$). Moreover, statistically significant differences were then reported between the two visits, in terms of IPSS, IIEF-5 and SF-36 scores ($p < 0.003$; $p < 0.001$; $p < 0.001$), only in the IDIProst® Gold group.*

***Conclusions.*** *In conclusions, we found that IDIProst® Gold significantly improve the quality of life of patients affected by LUTS due to BPH and ED, specifically in terms of sexual function, highlighting that a better sexual quality of life is correlated with an higher overall quality of life regardless of the urinary function.*

**KEY WORDS:** *BPH; LUTS; Erectile Dysfunction; Serenoa repens; Crocus sativus; Quality of Life.*

Submitted 27 July 2013; Accepted 5 October 2013 — No conflict of interest declared

## INTRODUCTION

Lower urinary tract symptoms due to benign prostatic hyperplasia (BPH/LUTS) and benign prostatic enlargement are very common diseases in men older than 40 years (1). Male sexual dysfunction are, also, very common in this population; in the *European Male Ageing Study* of 3,369 community-dwelling men aged 40-79 years, moderate or severe erectile dysfunction (ED) was reported by 6% of men in their forties, rising to 64% of men aged over

70 years (2). Moreover, in the *Multinational Survey of the Ageing Male* (MSAM-7) the overall prevalence of LUTS was 90%, while the overall prevalence of ED was 49%, highlighting that rate of ED was significantly dependent on age and correlated highly with the severity of LUTS (3). Both BPH/LUTS and sexual dysfunction have a substantial negative impact on a man's quality of life and are considered a serious socio-economic problem (4). The current therapies for BPH/LUTS are associated with bothering sexual side effects, however, differing in rate and characteristics between different classes of medications, different medications within the same classes, and different combinations of drugs (5). For these reasons, PDE5-Is are introduced in the Italian pharmacopeia as an effective and treatment for LUTS associated with ED. Even if PDE5-Is are effective either alone or in combination with α-blockers in men with BPH/LUTS, some adverse events, such as headache, dyspepsia, and back pain, are commonly reported (5). Furthermore, future studies are needed to evaluate the long-term safety and efficacy outcomes and the overall cost-effectiveness analysis of this treatment (5). On the basis of the evidences, the use of phytotherapy in treating lower urinary tract symptoms and benign prostatic hyperplasia has been popular in Europe for many years with promising results. In the last years, the attention has been focused on the both LUTS/BPH and ED treatment, due to the patient's request to improve his sexual and urinary quality of life. Recently, the Alfa-5® association of *Serenoa repens, Pinus massoniana Bark Extract* (PMBE) and *Crocus sativus*, named *IDIProst® Gold*, has been produced in order to improve the micturition parameters and sexual function in patients affected by LUTS/BPH and ED. The effects on micturition parameters are due to the effects of *Serenoa repens*, as well known, and the effect on sexual function has due to PMBE and *Crocus sativus*. We aimed to evaluate the efficacy of the Alfa-5® association *Serenoa repens*, PMBE and *Crocus sativus* (*IDIProst® Gold*) in improvement of patient's quality of life, when compared with *Serenoa repens* alone.

## Materials and methods

### *Study design*

All patients with clinical and instrumental diagnosis of LUTS due to BPH and ED, attending 5 Italians Urological Institutions from May to December 2012 were enrolled in this prospective, multicentre, phase 3 study.
All patients underwent clinical and instrumental examinations and IPSS, IIEF-5 and SF-36 questionnaires. After enrolment, all patients were assigned to receive oral capsules of *IDIProst® Gold* (one capsule q24h) or *Serenoa repens* 320 mg (one capsule q24h) for 3 months. The main outcome measure was the improvement of quality of life at the end of the whole study period, evaluated by questionnaires results.

### *Inclusion and exclusion criteria*

Patients were eligible for inclusion if they had to meet all of the following criteria: age of 50 years or older; to be sexually active; maximal urinary flow rate ($C_{max}$) of less than 15 mL/s; post-residual voided volume less than 100 cc; an *International Prostate Symptom Score* (IPSS) of 8 or greater and an *IPSS-quality of life* (QOL) score of 2 or greater; Prostate Specific Antigen (PSA) less than 4 ng/ml, or higher if negative prostate biopsy; an *International Index of Erectile Function* (IIEF-5) score less than 21; to be untreated for LUTS/BPH; testosterone level more than 3 ng/dL. We excluded all patients affected by major concomitant diseases such as diabetes, liver, and/or renal failure; had known anatomical abnormalities or malignancy of the urinary tract, bladder, or upper tract stones, diverticula, foreign bodies, prostatitis, active urinary tract infection, chronic retention or had polycystic kidney disease. Moreover, we excluded all patients with urethral stenosis interfering with the evaluation of voiding function; patients with a history of transurethral resections of the prostate (TURP), laser therapy, or thermotherapy. Similarly, all patients who tested positive for Sexually Transmitted Diseases such as *Chlamydia trachomatis*, *Ureaplasma urealyticum* or *Neisseria gonorrhoeae* were excluded. Moreover, all patients with allergy to one or more compounds of *IDIProst® Gold* were also excluded. All patients treated with PDE5-Is were excluded too.

### *Study and treatment schedule*

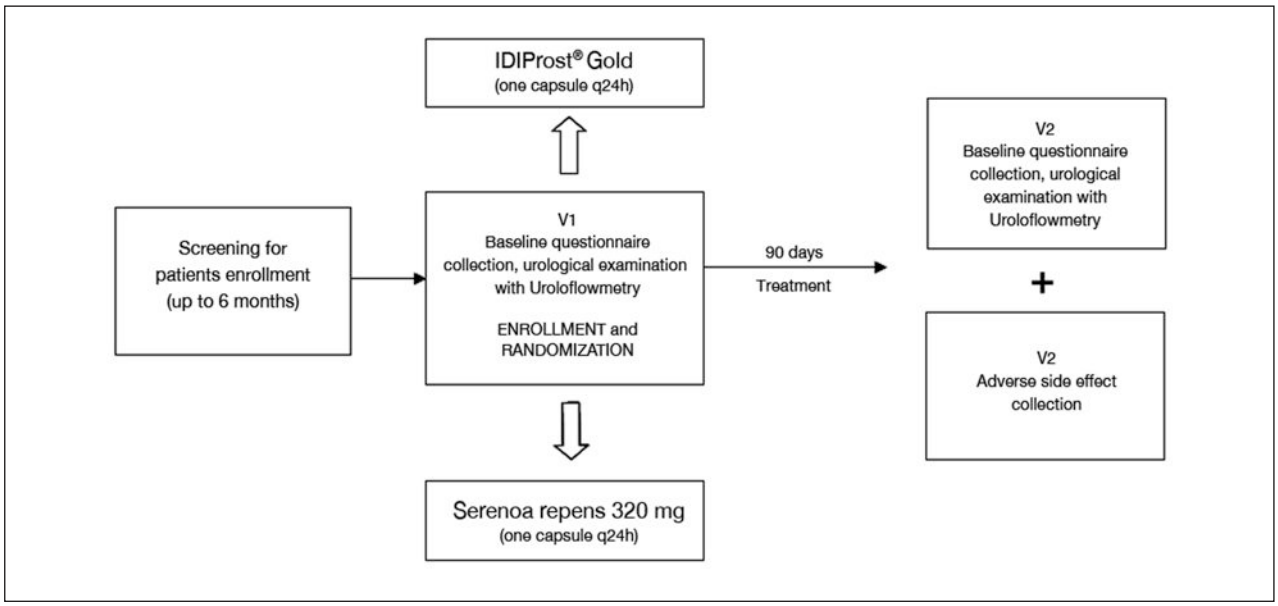
On arrival at each Centre, all eligible individuals signed written informed consent and underwent a baseline questionnaire, urological examination with anamnestic interview and uroflowmetry ($C_{max}$) with evaluation of post voided residual volume (PVR), in accordance with the procedure described in EAU guidelines (6). PSA value has been previously evaluated. All patients who met the inclusion criteria were assigned to groups according to a 1:1 randomization (Figure 1).
Group A: *IDIProst® Gold* (one capsule q24h).
Group B: *Serenoa repens* 320 mg (one capsule q24h).
All patients underwent treatment for 3 months. All patients were contacted by telephone on day 30 of the therapy to ensure correct timing and dose treatment. Each subject was scheduled for follow-up examination at 3 months from starting therapy, with a urological visit, uroflowmetry with evaluation of PVR and questionnaires to be filled in. No placebo arm was included. The possible biases caused by the lack of placebo arm were considered in the results analysis. The main outcome measure was the improvement of quality of life at the end of the whole study period, in terms of changes in IPSS, IPSS-QOL, $C_{max}$, PVR, SF-36 and the IIEF-5 from baseline to the evaluation point, that is, 3 months. Clinical failure was defined as the persistence of symptoms after the treatment, or the suspension of therapy for significant reported adverse effects. In addition, spontaneously reported adverse events, or those noted by the investigator, were recorded during the whole study period.
The study was conducted in line with Good Clinical Practice guidelines, with the ethical principles laid down in the latest version of the *Declaration of Helsinki*.

### *Questionnaires and urological examinations*

The validated Italian versions of the *International Prostatic Symptom Score* (IPSS) (7), *International Index of Erectile Function* (IIEF-5) (8) and SF-36 (9) were administered to each patient.

***Figure 1.***

*The figure shows the study design.*




The questionnaire was offered to the patient on arrival at each Centre. All questionnaires were also used in determining clinical therapy efficacy.

***Composition and characterisation of the extracts used***

All patients assigned to Group A were orally administered *IDIProst® Gold* once daily.

*IDIProst® Gold*

Each capsule (950 mg) contains the Alfa-5® association consists of *Serenoa repens* 320 mg, *Crocus sativus* 100 mg, *Pinus massoniana* 120 mg. All compound analyses were carried out according to *Fiamegoset et al.* (10). All patients assigned to Group B were orally administered *Serenoa repens* 320 mg.

***Statistical analysis***

In order to analyse the homogeneity of the two groups, the baseline characteristics were compared using the t test and Wilcoxon-Mann-Whitney test for continuous variables and by the chi-square test for categorical variables. The sample size was calculated prospectively under the following conditions: difference between the groups = 10%, Alpha Error Level = 0.05 two-sided, statistical power = 80% and anticipated effect size (Cohen's d = 0.5). The calculation yielded 2 × 64 individuals per group. Analysis of variance (ANOVA) was used for comparing means. Bonferroni adjustment test was also used at the second stage of the analysis of variance. The effect size between the means (Cohen's d) was also calculated. The differences between the groups regarding semen parameters were obtained using chi-square or Fisher's exact tests. Statistical significance was achieved when p was < 0.05. All reported p-values were two-sided. Statistical analyses were performed using SPSS 11.0 for Apple-Macintosh (*SPSS, Inc., Chicago, Illinois*).

## Results

From a total population of 146 patients with LUTS/BPH and ED, 132 patients were eventually enrolled and randomised. Out of the 14 patients excluded from the study, 10 had refused to be enrolled and 4 were lost at the follow-up. Finally, 132 were allocated (Figure 2). Anamnestic and clinical data at enrolment are described in Table 1. No statistically significant differences between the groups were found. From 132 enrolled patients, 85 were allocated to *IDIProst® Gold* and 46 to *Serenoa repens* 320 mg.

***Compliance to treatment schedule and adverse effects***

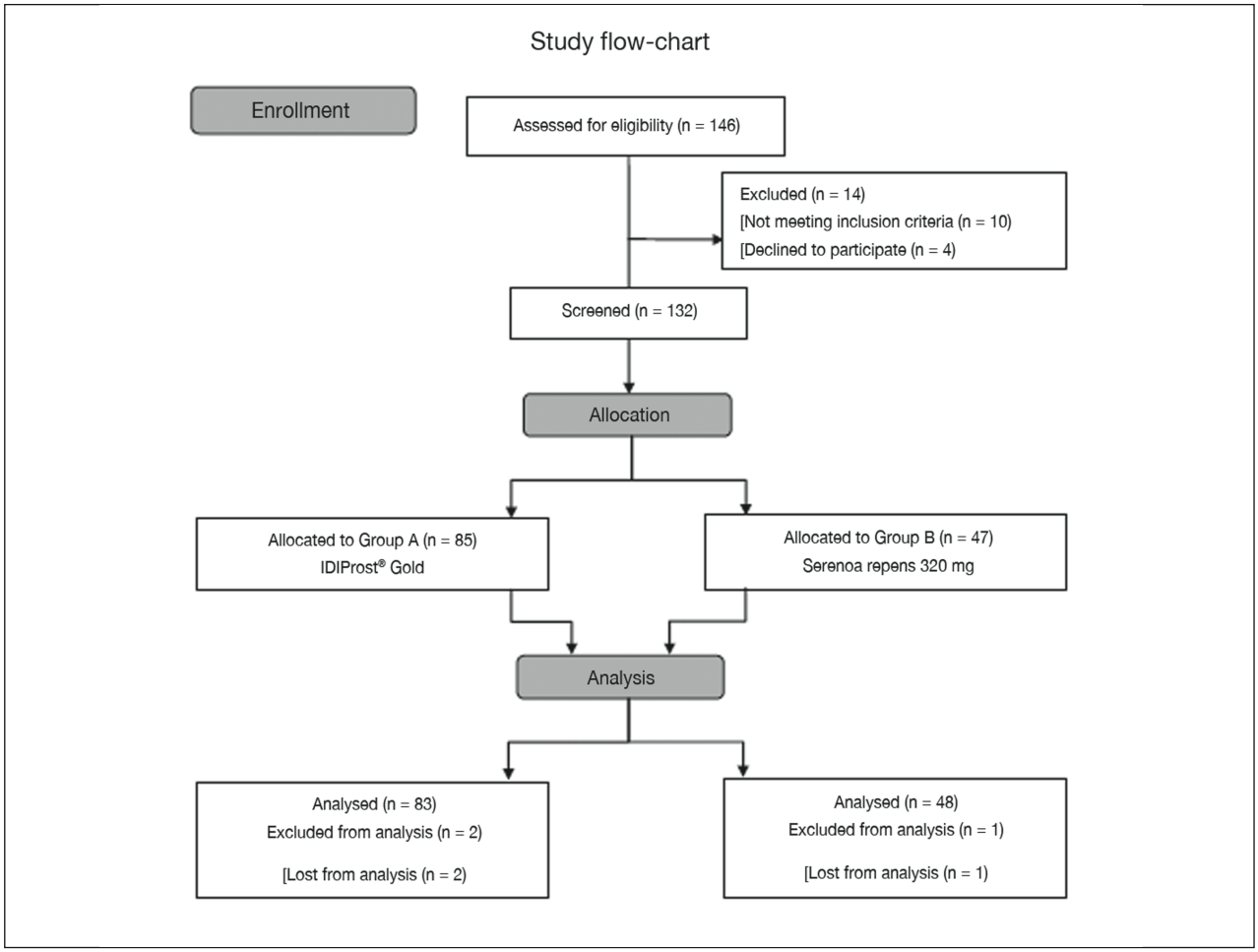
In Group A 83 patients (97.6%) were analysed after 2 were lost at follow up. In Group B 46 patients (97.8%) were analysed after 1 was lost at follow up (Figure 2). Accordingly, compliance to this study protocol was satisfactory. The *IDIProst® Gold* formulation was well tolerated in all patients analysed and there were no significant drug-related side effects. In Group A, 1 out of 83 patients (1.2%) had mild adverse effects that did not require treatment suspension. Also in Group B, 1 out of 46 patients (2.1%) reported mild adverse effects.

***Clinical and laboratory results at follow up***

At the follow-up examination (3 months after treatment), statistically significant differences have been reported between the two groups in terms of IPSS (11.9 vs 13.8; df = 127; t = 10.3; p < 0.001), IIEF-5 and SF-36 mean scores (19.3 *vs* 16.1; 99.7 *vs* 96.3; df = 127; t = 17.4; p < 0.003; df = 127; t = 18.4; p < 0.001). Moreover, statistically significant differences were then reported between the two visits, in terms of IIEF-5 and SF-36 scores (p < 0.001; p < 0.001), in the *IDIProst® Gold* group. Very few AEs have been reported in the both groups without any significant difference.

***Figure 2.***

*The figure shows the study flow-chart.*




The Table 2 shows all questionnaires results between the two groups at the enrolment and at the follow-up visit.

## Discussion

LUTS due to BPH and sexual dysfunction are very common in men and the association between LUTS/BPH and ED is very intriguing. Moreover, some epidemiological studies demonstrated that the association between LUTS/BPH and sexual dysfunction in ageing men is independent of the effects of age, other comorbidities and lifestyle factors (11). On the other hand, there is an increasing needed for drugs able to improve the patient's quality of life without adverse side effects. In the present study we evaluate the efficacy of *IDIProst® Gold* in improvement of patient's quality of life. We found some important findings: 1) the efficacy of *IDIProst® Gold* in improve urinary and sexual function in patients affected by LUTS/BPH and ED, when compared with *Serenoa repens* alone; 2) the improvement in sexual quality of life is linked with an higher overall quality of life regardless of the urinary function; 3) very few adverse side effects have been found in the *IDIProst® Gold* group.

The efficacy of *IDIProst® Gold* in the management of urinary and sexual function is due to the association between *Serenoa repens*, PMBE and *Crocus sativus*. Even if the efficacy of *Serenoa repens* appears to be a useful option for improving lower urinary tract symptoms (12), the association with PMBE and *Crocus sativus* is able to improve the efficacy of *Serenoa repens* due to: a) antioxidant effect, free radical scavenging activities and vasoprotective effect due to oligomeric proanthocyanidin complexes (OPC) of *Pinus massoniana* Bark Extract (PMBE) (13-14), b) increasing of nitric oxide activity by antioxidant effect of PMBE, c) apoptosis inducing properties of PMBE (15), d) promotion of the diffusion of oxygen in tissues due to *Crocus sativus* effect (16) and e) the aphrodisiac properties of *Crocus sativus* (17). Recently, *Hosseinzadeh et al.* demonstrated in an animal model study the aphrodisiac activity of *Crocus sativus* aqueous extract and its constituent crocin (18). Moreover, they demonstrated that crocetin, a constituent of saffron, significantly restored the endothelium-dependent relaxation of the thoracic aorta in hypercholesterolemic rabbit, which might be explained by its action to increase the vessel eNOS activity, leading to elevation of NO production (18).

***Table 1.***

*Clinical, instrumental and laboratory patient's data.*

| | IDIProst® Gold mean (SD or %) | Serenoa repens 320 mg mean (SD or %) |
|---|---|---|
| **Patients (n°)** | 83 | 46 |
| **Background information** | | |
| · Age | 58.9 (± 3.56) | 59.1 (± 3.68) |
| · Marital status | | |
| Married | 53 (63.8) | 30 (65.3) |
| Unmarried | 20 (24.0) | 11 (23.9) |
| Divorced | 10 (12.2) | 5 (10.8) |
| · Educational qualification | | |
| Primary School | 30 (36.2%) | 18 (39.1%) |
| High School | 29 (35.0%) | 15 (32.7%) |
| University | 24 (28.8%) | 13 (28.2%) |
| · Smooking | | |
| Yes | 28 (33.8) | 16 (34.7) |
| No | 55 (66.2) | 30 (65.3) |
| · Comorbidity Charlson Index | 1.9 (± 0.8) | 2.0 (± 0.9) |
| · BMI (Body Mass Index) | 26.9 (± 1.3) | 27.1 (± 1.1) |
| **Baseline clinical data** | | |
| · PSA total (ng/mL) | 2.02 (± 1.45) | 2.08 (± 1.59) |
| · PVR (mL) | 29.9 (± 28.8) | 32.8 (± 29.9) |
| · Uroflowmetry data $Q_{max}$ (mL/sec) | 11.7 (± 2.2) | 11.9 (± 2.1) |
| · Prostate volume (mL) | 43.9 (± 21.1) | 41.4 (± 17.2) |
| · IPSS | 17.1 (± 5.9) | 16.9 (± 5.8) |
| · IIEF-5 | 14.9 (± 3.5) | 15.1 (± 3.7) |
| · SF-36 | 96.4 (± 1.1) | 96.9 (± 1.2) |

*The table shows the anamnestic, clinical and instrumental data from all patients at the enrolment time.*
*n° = number; SD or % = Standard Deviation or percentage; PVR = post-residual voided volume; IPSS = International Prostate Symptom Score; IIEF-5 = International Index of Erectile Function; SF-36 = Short Form-36.*

***Table 2.***

*Questionnaires results at the enrolment and at the follow-up visit.*

| | IDIProst® Gold mean (SD) | Serenoa repens 320 mg mean (SD) |
|---|---|---|
| **IPSS** | | |
| v1 | 17.1 (± 5.9) | 16.9 (± 5.8) |
| v2 | 11.9 (± 1.1) | 13.8 (± 1.3) |
| **IIEF-5** | | |
| v1 | 14.9 (± 3.5) | 15.1 (± 3.7) |
| v2 | 19.3 (± 1.0) | 16.1 (±1.2) |
| **SF-36** | | |
| v1 | 96.4 (± 1.1) | 96.9 (± 1.2) |
| v2 | 99.7 (± 1.2) | 96.3 (± 2.3) |

*The table shows all questionnaires results between the two groups at the enrolment and at the follow-up visit.*
*v1 = visit 1 (time 0); v2 = visit 2 (after 3 months). SD = Standard Deviation; IPSS= International Prostate Symptom Score; IIEF-5 = International Index of Erectile Function; SF-36 = Short Form-36*

The same authors highlighted that as crocin (the crocetin digentiobiosyl-ester) converts to crocetin, it is possible that this component acts in a way similar to PDE-5 inhibitors such as sildenafil (18).
Furthermore, *Crocus sativus* seems to have affinity to bind benzodiazepine receptors (19) and exhibited antidepressant activity that it might inhibit the reuptake of serotonin (20).
Moreover, *Shamsa et al.* in a clinical trial found that after the ten days of taking saffron there was a statistically significant improvement in tip rigidity and tip tumescence as well as base rigidity and base tumescence, highlighting that *Crocus sativus* showed a positive effect on sexual function with increased number and duration of erectile events seen in patients with ED even only after taking it for ten days (21).
These are the pharmacological basis justifying the effectiveness of *IDIProst® Gold*. Another aspect to discuss is the fact that we have found that an improvement in sexual quality of life is linked with a higher overall quality of life regardless of the urinary function. It could be due to the fact that the impact of sexual dysfunction on patients' quality of life is higher than LUTS, as demonstrated by several authors (3, 22.)
Finally, the present study shows few limitations to take into account; firstly, the lacks of placebo arm.
However, we planned this study without a placebo arm due to the fact that we think that is not ethical to not treat patients with LUTS/BPH and ED. Moreover, the short follow-up period that not allows to evaluate the possible adverse side effect at long time.

## Conclusion

In conclusions, we found that *IDIProst® Gold* significantly improve the quality of life of patients affected by LUTS due to BPH and ED, specifically in terms of sexual function, highlighting that a better sexual quality of life is correlated with an higher overall quality of life regardless of the urinary function.

## References


*1. Girman CJ, Jacobsen SJ, Guess HA, et al. Natural history of prostatism: relationship among symptoms, prostate volume and peak urinary flow rate. J Urol. 1995; 153:1510-5.*

*2. Corona G, Lee DM, Forti G, et al. Age-related changes in general and sexual health in middle aged and older men: results from the European Male Ageing Study (EMAS). J Sex Med. 2010; 7:1362-80.*

*3. Rosen R, Altwein J, Boyle P, et al. Lower urinary tract symptoms and male sexual dysfunction: the Multinational Survey of the Aging Male (MSAM-7). Eur Urol. 2003; 44:637-49.*

*4. Robertson C, Link CL, Onel E, et al. The impact of lower urinary tract symptoms and comorbidities on quality of life: the BACH and UREPIK studies. BJU Int. 2007; 99:347-54.*

*5. Gacci M, Corona G, Salvi M, et al. A systematic review and meta-analysis on the use of phosphodiesterase 5 inhibitors alone or in combination with α-blockers for lower urinary tract symptoms due to benign prostatic hyperplasia. Eur Urol. 2012; 61:994-1003.*

*6. Madersbacher S, Alivizatos G, Nordling J, et al. EAU 2004 guidelines on assessment, therapy and follow-up of men with lower urinary tract symptoms suggestive of benign prostatic obstruction (BPH guidelines). Eur Urol. 2004; 46:547-54.*

*7. Badia X, Garcia-Losa M, Dal-Re R. Ten-language translation and harmonization of the International Prostate Symptom Score: developing a methodology for multinational clinical trials. Eur Urol 1997; 31:129-40.*

*8. Rosen RC, Riley A, Wagner G, et al. The international index of erectile function (IIEF): a multidimensional scale for assessment of erectile dysfunction. Urology. 1997; 49:822-30.*

*9. Apolone G, Mosconi P. The Italian SF-36 Health Survey: translation, validation and norming. J Clin Epidemiol. 1998; 51:1025-36.*

*10. Fiamegos YC, Nanos CG, Vervoort J, Stalikas CD. Analytical procedure for the in-vial derivatization-extraction of phenolic acids and flavonoids in methanolic and aqueous plant extracts followed by gas chromatography with mass-selective detection. J Chromatogr. A 2004; 1041:11-8.*

*11. Mirone V, Sessa A, Giuliano F, et al. Current benign prostatic hyperplasia treatment: impact on sexual function and management of related sexual adverse events. Int J Clin Pract. 2011; 65:1005-13.*

*12. Wilt TJ, Ishani A, Rutks I, MacDonald R. Phytotherapy for benign prostatic hyperplasia. Public Health Nutr. 2000; 3:459-72.*

*13. Cui YY, Xie H, Qi KB, et al. Effects of Pinus massoniana bark extract on cell proliferation and apoptosis of human hepatoma BEL-7402 cells. World J Gastroenterol. 2005; 11:5277-82.*

*14. Neuwirt H, Arias MC, Puhr M, et al. Oligomeric proanthocyanidin complexes (OPC) exert anti-proliferative and pro-apoptotic effects on prostate cancer cells. Prostate. 2008; 68:1647-54.*

*15. Ma H, Liu B, Feng D, et al. Pinus massoniana bark extract selectively induces apoptosis in human hepatoma cells, possibly through caspase-dependent pathways. Int J Mol Med. 2010; 25:751-9.*

*16. Rìos JL, Recio MC, Giner RM, Manez S. An update review of saffron and its active constituents. Phytother Res. 1996; 10:189-193.*

*17. Madan CL, Kapur BM, Gupta US. Saffron. Econ Bot. 1966; 20:377.*

*18. Hosseinzadeh H, Ziaee T, Sadeghi A. The effect of saffron, Crocus sativus stigma, extract and its constituents, safranal and crocin on sexual behaviors in normal male rats. Phytomedicine. 2008; 15:491-5.*

*19. Hosseinzadeh H, Sadeghnia HR. Protective effect of safranal on pentylenetetrazol-induced seizures in the rat: involvement of GABAergic and opioids systems. Phytomedicine. 2007; 14:256-262.*

*20. Hosseinzadeh H, Karimi Gh, Niapoor M, Antidepressant effects of Crocus sativus stigma extracts and its constituents, crocin and safranal, in mice. Acta Hortic. 2004; 650:435-445.*

*21. Shamsa A, Hosseinzadeh H, Molaei M, et al. Evaluation of Crocus sativus L. (saffron) on male erectile dysfunction: a pilot study. Phytomedicine. 2009; 16:690-3.*

*22. Lowe FC. Treatment of lower urinary tract symptoms suggestive of benign prostatic hyperplasia: sexual function. BJU Int. 2005; 95 (Suppl 4):12-8.*


## *Appendix

*IDIProst® Gold Study Group.*

*Università degli Studi di Napoli "Federico II" - Prof. Vincenzo Mirone: Marco Franco, Roberto La Rocca.*

*Università degli Studi di Catania - Prof. Giuseppe Morgia: Costanza Salamone, Claudia Calì.*

*Università degli Studi di Foggia - Prof. Giuseppe Carrieri: Giuseppe Di Fino, Mario De Siati.*

*Università degli Studi del Piemonte Orientale - Prof. Carlo Terrone: Angela Maurizi.*

*Università degli Studi di Milano - Prof. Francesco Rocco: Franco Gadda.*


**Correspondence**

*Tommaso Cai, MD (Corresponding Author)*
Department of Urology, Santa Chiara Regional Hospital, Trento, Italy.
Largo Medaglie d'Oro, 9
ktommy@libero.it

*Giuseppe Morgia, MD*
Department of Urology and Department of Hygiene
and Public Health University of Catania, Catania, Italy

*Giuseppe Carrieri, MD*
Department of Urology and Renal Transplantation
University of Foggia, Foggia, Italy

*Carlo Terrone, MD*
Division of Urology, ASO Maggiore della Carità University Hospital
University of Eastern Piedmont, Novara, Italy

*Ciro Imbimbo, MD*

*Paolo Verze, MD*

*Vincenzo Mirone, MD*
Department of Urology
University Federico II, Napoli, Italy