

Effect of body mass and physical activity at younger age on the risk of prostatic enlargement and erectile dysfunction: results from the 2018 #Controllati survey

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List of abbreviations:

BMI: body mass index

CI: confidence interval

DRE: digital rectal examination

ED: erectile dysfunction

OR: Odds ratios

PA: physical activity

PE: prostatic enlargement

SIU: Italian Society of Urologists

Summary

Objective: *Overweight and low physical activity (PA) increase the risk of prostatic enlargement (PE) and erectile dysfunction (ED). Less clear is the role of these factors at young age on the lifelong risk.*

Material and Methods: *During June 2018 the Italian Society of Urologists organized the month of Male Urologic Prevention "#Controllati". Men aged 18 years or more were invited to attend urologic centers for a visit and counselling about urologic/ andrologic conditions. Each participating man underwent a physical examination and was asked about urologic symptoms, sexual activity and possible related problems.*

Results: *We analyzed data from 2786 men, aged 55.1 years (SD 10.9, range 19-97). A total of 710 (25.5%) subjects had a diagnosis of PE and 632 (22.7%) of DE. Overweight/obese men were at increased risk of PE and ED the corresponding odds ratio,OR, in comparison with normal or underweight men, being respectively 1.18 (95%Confidence Interval, CI, 1.00-1.44) and OR 1.69 (95%CI 1.39-2.05). In comparison with men reporting at age 25 a BMI <25.0 the OR of PE was among men with a BMI at 25 years of age ≥ 25 was 1.22 (95%CI 1.01-1.51); the corresponding value for ED was 1.17 (0.92-1.48).Considering total PA at diagnosis, the OR of PE was, in comparison with no or low PA, 0,69(95%CI 0,55-0,86) among men reporting moderate PA and 0,75 (95%CI 0,58-0,98) among those reporting intense PA. When we considered PA at 25 years of age, the OR of subsequent diagnosis of PE were, in comparison with men reporting no/low PA at 25 years of age, 0,81(95%CI 0,63-1,04) for men reporting moderate PA and 0,70(95%CI 0,52-0.99) for those reporting intense PA.*

Conclusion: *These findings underline the role of encouraging healthy lifestyle habits among young men in order to reduce the subsequent risk of PE and ED.*

KEY WORDS: *Benign prostatic enlargement (BPE); Hypertension; Diabetes; Hearth disease; Body mass index; Physical activity.*

Introduction

Benign prostatic enlargement (PE) and erectile dysfunction (ED) are the two most common urologic diseases in men, the estimated prevalence of PE being about 10% in the fourth decades increasing till 50% thereafter and of ED being of 12% (1,2).

Among the risk factors for these two conditions lifestyles play a major role.

It is well recognized, for example, that overweight, low physical activity (PA), hypertension, hypercholesterolemia, hypertriglyceridemia increase the risk of these conditions at advanced ages. (3-6).

Less clear is the role of these factors at young age on the lifelong risk (7).

Since 2016 the Italian Urologic Society (SIU, Società Italiana di Urologia) coordinates a huge preventive initiative: the month of Male Urologic Prevention "*#Controllati*". (8,9)

In the framework of this preventive campaign data have been collected on determinants of the risk of PE and ED.

In this paper we present the results of the 2018 initiative with a special focus on risk factors for PH and ED at young age and lifelong risk of the conditions.

Methods

During June 2018, men aged 18 years or more were invited to attend participating urologic centers for a free of charge visit and counselling about urologic or andrologic conditions.

A pamphlet inviting men for check-up was distributed in chemists and general practitioners' waiting rooms.

An advertising campaign was also set in the press.

At the moment of the visit, general data were recorded using a simple questionnaire.

The first section of the questionnaire, including data on age, life habits height and weight, was completed by the patient.

The section on PA included questions on self reported intensity ('none', 'low', 'moderate', 'intense') of activity at work and in leisure time separately. History of hypertension, diabetes, cardiopathy, hypertriglyceridemia and hypercholesterolemia were checked by the urologist. Information have been also collected on body mass index (BMI) and total PA at age 25 years among men aged 30 years or more.

Each participating man underwent a physical examination (including digital rectal examination, DRE) and was asked by the urologist about urologic symptoms, sexual activity and possible related problems. Diagnosis of PE was made by the urologist after DRE.

Erectile function was assessed by asking men about their sexual performance: ED was diagnosed according to the definition of the NIH Consensus Development Panel (10), when a man was consistently unable to attain or maintain a penile erection sufficient for satisfactory sexual performance.

The 2002 ICS definitions were used for frequency, nocturia, urgency, dysuria (intermittency, slow stream, straining, terminal dribble, postmicturition dribble) incomplete emptying (11).

Smoker was defined a man who had smoked more than one cigarette/day for at least one year; ex-smoker a man who had smoked more than one cigarette/day for at least one year, but had stopped more than one year before the interview, and non-smoker if he had never smoked more than one cigarette/day.

Total PA was evaluated combining occupational and leisure time PA.

Frequencies (percent,%) were computed as appropriate. Odds ratios (OR), and the corresponding 95% confidence intervals (CI), adjusted for age were derived using unconditional multiple logistic regression, fitted by the method of maximum likelihood, in which the dependent variable was the presence (case) or absence (control) of the condition and the independent ones were the exposures considered in the analysis. We included in the model age considered as categorical variables (12).

Results

During the 2018 campaign a total of 3092 men entered the study. After exclusion of men who underwent previous surgery for partial and complete prostatectomy and those who did not answer at least one of two questions about PA, we analyzed data from 2786 men, aged 55.1 years (SD 10.9, range 19-97). The reason for visit was urinary symptoms in 504 (18.1%), sexual problems in 270 (9.7%), renal disease in 68 (2.4%) and prostatic problems in 429 (15.4%)(more than one reason was allowed). Prevention was the only reason for consultation in 1776 subjects (63.8%).

A total of 710 (25.5%) subjects had a diagnosis of PE and 632 (22.7%) of DE.

Table 1 shows the distribution, and the corresponding OR, of study subjects according to the diagnosis of PE, ED and age, smoking habits and BMI.

The risk of PE and ED increased with age: in comparison with men aged ≤ 40 years or less, the risk of PE was respectively 2.57, 7.22, 17.97 and 39.1 in the age classes 41-50, 51-60, 61-70 and ≥ 71 . The corresponding values for ED were 1.15, 1.63, 3.06 and 4.87.

Smoking increased the risk of ED: in comparison with never smokers, ex smokers had an increased risk of ED of 1.38 (95%CI 1.11-1.69), and current smokers of 1.92(95%CI 1.49-2.48).

Overweight/obese men were at increased risk of PE and ED the corresponding OR, in comparison with normal or underweight men, being respectively 1.18 (95%CI 1.00-1.44) and OR 1.69 (95%CI 1.39-2.05).

We have also considered (among men aged 30 years or more) the role of overweight/obesity at 25 years of age on the subsequent risk of PE and ED.

In comparison with men reporting at age 25 a BMI < 25.0 , the OR of PE was, among men with a BMI at 25 years of age ≥ 25 , 1.22 (95%CI 1.01-1.51); the corresponding value for ED was 1.17 (95%CI 0.92-1.48).

Table 2 considers the relation between PE and DE and urinary symptoms, hypertension, diabetes, cardiopathy, hypertriglyceridemia and hypercholesterolemia.

A history of hypertension, diabetes, cardiopathy, high cholesterol levels were significantly associated to an increased PE risk in the total series. Likewise, hypertension, diabetes, cardiopathy, high triglyceride and cholesterol levels were significantly associated to an increased risk of ED.

PA was significantly associated with a decreased risk of PE: considering the total PA at diagnosis, the OR of PE was, in comparison with men reporting no or low PA, 0,69 (95% CI 0,55-0,86) among men reporting moderate PA and 0,75(0,58-0,98)among those reporting intense PA.

The OR of subsequent diagnosis of PE were, in comparison with men reporting no/low PA at 25 years of age 0,81 (95%CI 0,63-1,04) for men reporting moderate PA and 0,70 (95%CI0,52-0,99) for those reporting intense PA at 25 years of age. Similar findings emerged when we considered ED risk.

Discussion

The general results of this analysis show that low PA, high BMI and a history of hypertension, diabetes, hypercholesterolemia, cardiopathy increase the risk of PE. High BMI and low PA at 25 year of age increase the risk of PE at older ages. Similar results emerged also for the risk profile of ED.

Limitations

As already discussed in the papers presenting the results of 2016 and 2017 initiative (8,9), the major flaw of this study is that the study population were men voluntarily presenting to the participating centers. The participating centers were not randomly identified among all Italian urologic centers, so they cannot be considered representative of all Italian centers. However, they were well distributed

over the main areas of the country. In any case, any inference from the present analysis must be made in strictly comparative terms and strictly referred to men attending urologic services.

The diagnosis of PE was based on DRE that tends to underestimate the prostatic volume (2). Any misclassification of men with or without BPE or should lower the observed associations.

With regard to the diagnosis of DE it was reported by the men and checked for standard criteria by the physician.

The results of this study confirm data from different populations that have reported that high BMI, low PA and a history of hypertension, diabetes, hypercholesterolemia, increase the risk of PE at all ages. (13,14)

All these findings underline that benign PE shares similar risk factors with metabolic syndrome and cardiovascular diseases.

The etiological mechanisms that links these risk factors and the prostatic growth is not completely understood. However, it has been shown that lipids (oxidized low-density lipoprotein) increase *in vitro* the secretion of growth and pro-inflammatory factors by human stromal BPE cells in culture (15). Along this line, in a clinical perspective, the addition of statins to standard therapy for benign PE lowered prostate volume (16). Further, alteration of sex steroid hormone metabolism caused by both obesity and diabetes could lead to 'pro-inflammatory' conditions, causing release of chemokines potentially associated with prostate enlargement. (17)

Regular PA it has been consistently reported to decrease the risk of PE. A meta-analysis has shown that moderate-to-vigorous physical activity was associated with up to a 25% decreased risk of benign PE, with the magnitude of the protective effect increasing with the higher levels of activity (18).

An interesting findings from the present study is the observation that the OR of PE and ED associated with none/low PA and high BMI at 25 years were higher than unity.

Few data have been published on the role of PA at younger ages on the lifetime risk of PE. A previous Italian case control study have reported that moderate/intense recreational physical activity (>2 hours week) at age 30-39 decrease the risk of benign PE of about 30%.The Authors concluded that avoidance of sedentary lifestyle through a moderate recreational PA at any age may help preventing a sizeable number (e.g., approximately 20%) of benign PE cases (7).

With regard to erectile dysfunction, the risk profile of ED was largely similar with that observed for PE. In particular, the present analysis confirms that smoking, overweight, low PA and a history of diabetes, hypertension, cardiopathy, hypercholesterolemia, hypertriglyceridemia, all increased the risk of ED.

All these findings underline the role of encouraging healthy lifestyle habits among young men in order to reduce the subsequent risk of PE and ED.

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Table 1. Odds ratios (and corresponding 95% confidence intervals) of BPE and erectile dysfunction according to selected factors.

	Benign prostatic enlargement				Age adj OR (95%CI)	Erectile dysfunction				Age adj OR (95%CI)
	No		Yes			No		Yes		
	No.(%)		No.(%)			No.(%)		No.(%)		
<u>Age (years)</u>										
≤40	166	7.8	7	0.9	1	150	6.8	23	3.5	1
41-50	782	36.8	87	11.5	2.57 (1.17-5.66)	736	33.2	133	20.0	1.15 (0.71-1.85)
51-60	718	33.8	225	29.6	7.22 (3.34-15.63)	752	33.9	191	28.7	1.63 (1.02-2.60)
61-70	339	16.0	269	35.4	17.97 (8.29-38.96)	413	18.6	195	29.3	3.06 (1.91-4.90)
≥ 71	118	5.6	171	22.5	35.10 (15.83-77.86)	165	7.4	124	18.6	4.87 (2.94-8.06)
<u>Smoking habits</u>										
Never	1131	53.3	342	45.1	1	1198	54.1	275	41.3	1
Ex smokers	624	29.4	303	39.9	1,2(0.98-1.47)	668	30.1	259	38.9	1.38 (1.12-1.69)
Current smokers	343	16.2	103	13.6	1,1(0.84-1.47)	317	14.3	129	19.4	1.92 (1.49-2.48)
< 10 cig/day	127	8.5	34	7.5	0.94(0.58-1.53)	130	8.5	31	7.6	1.49 (0.96-2.29)
≥ 10 cig/day	192	12.9	67	14.8	1.27 (0.90-1.78)	174	11.3	85	21.0	2.25 (1.66-3.06)
<u>BMI (kg/m2)</u>										
<25.0	891	43.2	253	35.8	1	949	44.1	195	30.8	1
≥25.0	1172	56.8	453	64.2	118. (1.00-1.44)	1189	55.2	436	69.0	1.69 (1.39-2.05)
<u>BMI at 25 years of age**</u>										
<25.0	1293	62.3	443	62.4	1	1335	62.0	401	63.4	1
≥ 25.0	384	18.5	123	17.3	1.22 (1.01-1.51)	381	17.7	126	19.9	1.17 (0.92-1.48)

*Sometimes, the sums do not add up the total due to missing values

°reference category OR: odds ratio; CI: confidence interval. Nd. Not determined

<u>emia</u>										
No	1548	72.9	492	64.8	1	1613	72.8	427	64.1	1
Yes	301	14.2	143	18.8	1,30(1,02-1,67)	315	14.2	129	19.4	1.42 (1.11-1.81)
Missing	274	12.9	124	16.3		288	13.0	110	16.5	-

*Sometimes, the sums do not add up the total due to missing values

**one or more of the followings: nocturia, urgency, dysuria (intermittency, slow stream, straining, terminal dribble, postmicturition dribble) incomplete emptying.

°reference category

adjOR: adjusted odds ratio; CI: confidence interval.

Table 3. Odds ratios (and corresponding 95% confidence intervals) of premature ejaculation and erectile dysfunction according to physical activity.

	Benign prostatic enlargement				adjOR (95%CI)	Erectile dysfunction				adjOR (95%CI)
	No		Yes			No		Yes		
	No.(%)		No.(%)			No.(%)		No.(%)		
Occupational PA										
None/Low	1002	48.3	354	49.9	1	1035	48.1	321	50.8	1
Moderate	631	30.4	198	27.9	0,89 (0,7-1,1)	657	30.5	172	27.2	0,86 (0,69-1,08)
Intense	283	13.6	80	11.3	0,97(0,72-1,31)	286	13.3	77	12.2	0.98 (0.73-1.30)
Missing	160	7.7	78	11.0		176	8.2	62	9.8	-
Leisure PA										
Low	767	36.9	317	44.6	1	785	36.4	299	47.3	1
Moderate	893	43.0	272	38.3	0,67(0,55-0,83)	926	43.0	239	37.8	0.66 (0.54-0.80)
Intense	319	15.4	84	11.8	0,64 (0,51-0,91)	342	15.9	61	9.7	0.48 (0.36-0.66)
Missing	97	4.7	37	5.2		101	4.7	33	5.2	-
Total PA										
Low	537	25.9	228	32.1	1	544	25.3	221	35.0	1
Moderate	960	46.2	308	43.4	0,69(0,55-0,86)	995	46.2	273	43.2	0.65 (0.53-0.80)
Intense	515	24.8	144	20.3	0,75(0,58-0,98)	545	25.3	114	18.0	0.56 (0.43-0.72)
Missing	64	3.1	30	4.2		70	3.2	24	3.8	-
PA at 25 years of age										
Low	401	19.3	160	22.5	1	415	19.3	146	23.1	1
Moderate	820	39.5	273	38.5	0,81(0,63-1,04)	858	39.8	235	37.2	0.78 (0.61-0.99)
Intense	773	37.2	244	34.4	0,70(0,52-0,99)	785	36.4	232	36.7	0.74 (0.58-1.10)
Missing	82	3.9	33	4.6		96	4.5	19	3.0	-

*Sometimes, the sums do not add up the total due to missing values

°reference category adjOR: adjusted odds ratio; CI: confidence interval.

*Participating centers:

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Voghera (Mensi Mario); Azienda Socio Sanitaria Territoriale Santi Paolo e Carlo, Milano (Dormia Guido);

Campus Università degli Studi "Gabriele d'Annunzio" Chieti (Raffaele Tenaglia); Casa di Cura Ambrosiana Cesano Boscone (Catanzaro Francesco); Casa di Cura Gibiino Catania (Ranno Christian); Casa di Cura Giovanni XXIII, Monastier di Treviso (Morana Carmelo); Casa di Cura Guarnieri, Roma (Di Marco Massimiliano); Casa di Cura Luigi Cobellis Vallo della Lucania (Cavaliere Aniello); Casa di Cura Malatesta Novello Cesena (Cuzzocrea Diego); Casa di Cura Musumeci Gecas Gravina di Catania (Leonardi Rosario); Casa di Cura Nuova Clinica Santa Rita Benevento (Coscione Mario); Casa di Cura Nuova Villa Claudia, Roma (Giulianelli Roberto); Casa di Cura Regina Pacis, San Cataldo (Cammarata Carla); Casa di Cura Romolo Hospital Rocca di Neto (Cappa Manlio); Casa di Cura S. Rita, Atripalda De Simone Elia Virginio; Casa di Cura San Camillo Messina (Bruschetta Sebastiano); Casa di Cura Santa Lucia San Giuseppe Vesuviano (Casoli Eugenio); Casa di Cura Sileno ed Anna Rizzola, San Donà di Piave (Loiero Gaetano); Casa di Cura Trusso, Ottaviano (De Stefano Giacomo); Casa di Cura Villa Betania, Roma (Buscarini Maurizio); Casa di Cura Villa dei Fiori, Mugnano di Napoli (Jungano Renato); Casa di Cura Villa Esther, Avellino (Di Martino Mario); Casa di Cura Villa Fiorita, Prato (Dami Andrea Cesare); Casa di Cura Villa Igea, Ancona (Cafarelli Angelo); Casa di Cura Villa Maria, Mirabella Eclano (Morelli Emilio); Casa di Cura Villa Stabia Castellammare di Stabia (Scognamiglio Giuseppe); Centro Medico Politerapica, Seriate (Paolo Belvisi); Clinica Athena Villa dei Pini, Piedimonte Matese (Dalena Giuseppe); Clinica Padre Pio, Mondragone (Sepe Giuseppe Salvatore); Clinica Pierangeli, Pescara (Pompa Paolo); Clinica Villa Pia, Roma (Campagna Adriano); Casa di Cura Pederzoli, Peschiera del Garda (Grosso Gaetano); Ospedale Generale Regionale F. Miulli, Acquaviva delle Fonti (Ludovico Giuseppe Mario); Ospedale Galliera, Genova (Introini Carlo); Fondazione Policlinico IRCCS, Milano (Montanari Emanuele); Fondazione PTV Policlinico, Tor Vergata, Roma (Vespasiani Giuseppe); Grande Ospedale Metropolitano Bianchi Melacrino Morelli, Reggio Calabria (Cozzupoli Pietro); Hesperia Hospital, Modena (Ferrari Giovanni); Humanitas Gradenigo, Torino (Muto Giovanni); Humanitas San Pio X, Milano (Nava Luciano); IRCCS Policlinico San Donato (Carmignani Luca); IRCCS AOU San Martino IST, Genova (Terrone Carlo); Istituti

Clinici Zucchi, Monza (Stefano Casellato); Istituto Clinico S. Anna, Brescia (Najati Alrabi); Istituto Europeo di Oncologia, Milano (De Cobelli Ottavio); Istituto Nazionale Tumori IRCCS "Fondazione Pascale" Napoli (Perdonà Sisto); Ospedale Casa Sollievo della Sofferenza, San Giovanni Rotondo (Cisternino Antonio); Ospedale Buon Consiglio Fatebenefratelli, Napoli (Imperatore Vittorio); Ospedale Cardarelli, Napoli (Fedelini Paolo); Ospedale Carlo Urbani, Jesi (Ferrara Vincenzo); Ospedale Civico di Cristina Benfratelli, Palermo (Gianfranco Savoca); Ospedale Civile di Guastalla (Frattini Antonio); Ospedale Civile P.O. Dell'Annunziata, Cosenza (Emilio De Giacomo); Ospedale Civile Ramazzini Carpi (Barusi Maurizio); Ospedale Civile S. Giacomo, Monopoli (Vito Domenico Ricapito); Ospedale Civile San Salvatore, L'Aquila (Di Clemente Luigi); Ospedale Cottolengo, Torino (Scoffone Cesare Marco); Ospedale degli Infermi, Rimini (Montanari Francesco); Ospedale del Mare, Napoli (Zito Aniello Rosario); Ospedale della Murgia Fabio Perinei, Altamura (De Siati Mario); Ospedale di Bassano del Grappa (Celia Antonio); Ospedale di Belcolle, Viterbo (Rizzotto Antonio); Ospedale di Senigallia (Vincenzo Ferrara); Ospedale di Sondrio (Giumelli Pierluigi); Ospedale di Villafranca di Verona (Pecoraro Giuseppe); Ospedale Cristo Re, Roma (Lorenzo Defidio); Ospedale Don Tonino Bello Molfetta (Altomare Mauro); Ospedale Garibaldi Nesima, Catania (La Rosa Pasquale Gianfranco); Ospedale ICOT, Latina (Carbone Antonio); Ospedale L. Bonomo, Andria (Corvasce Antonio); Ospedale Madonna delle Grazie, Matera (Disabato Giuseppe); Ospedale Maggiore, Bologna (Emili Emilio); Ospedale Maria SS. Addolorata, Erboli (Tufano Antonio); Ospedale Niguarda Ca' Granda, Milano (Bocciardi Aldo); Ospedale Privato Accreditato Villa Regina, Bologna (Cuzzocrea Diego Ettore); Ospedale Villa Serena, Forlì (Zambelli Massimo); Ospedale S. Giacomo di Novi Ligure (Montefiore Franco); Ospedale S. Giovanni in Persiceto (Emilo Emili); Ospedale S. Maria della Misericordia, S. Andrea delle Fratte Perugia (Ettore Mearini); Ospedale S. Maria delle Croci, Ravenna (Voce Salvatore); Ospedale S. Raffaele Turro, Milano (Gaboardi Franco); Ospedale Sacro Cuore di Gesù Fatebenefratelli, Benevento (Ferravante Paolo); Ospedale Sacro Cuore Don Calabria, Negrar (Cavalleri Stefano); Ospedale San Bartolomeo, Sarzana (Conti Enrico); Ospedale San Biagio Domodossola Rosa

Antonio; Ospedale San Camillo Forlanini, Roma (Gaffi Marco); Ospedale San Donato, Arezzo (De Angelis Michele); Ospedale San Giacomo Apostolo, Castelfranco Veneto (Luca De Zorzi); Ospedale San Giovanni Battista, Foligno (Mearini Luigi); Ospedale San Giovanni di Dio, Agrigento (Ruoppolo Michele); Ospedale San Pio da Pietrelcina, Vasto (Schips Luigi); Ospedale San Raffaele, Milano (Montorsi Francesco); Ospedale San Salvatore. Pesaro (Beatrici Valerio); Ospedale San Tommaso dei Battuti, Portogruaro (Amenta Michele); Ospedale Sant'Ottone Frangipane, Ariano Irpino (Grasso Gerardo); Ospedale Santa Maria Misericordia, Udine (Valotto Claudio); Ospedale Santa Maria Regina degli Angeli, Adria (Meneghini Agostino); Ospedale Santissima Trinità, Cagliari (De Lisa Antonello); Ospedale Spoke, Locri (Capocasale Francesco); Ospedale SS. Capitanio e Gerosa, Lovere (Ranieri Antonio); Ospedale Vincenzo Monaldi, Napoli (Uricchio Francesco); Ospedali Riuniti di Ancona (Galosi Andrea Benedetto); Ospedali Riuniti di Foggia (Carrieri Giuseppe), Presidio Ospedaliero Cerignola (Annunziata Gennaro); P.O. S. Marta e S. Venera di Acireale (Ingrassia Antonino); P.O. Umberto I, Enna (D'Anca Michele); Policlinico Agostino Gemelli, Roma (Bassi Pierfrancesco); Policlinico di Abano Terme (Porreca Angelo); Ospedale Civile di Baggiovara (Bianchi Giampaolo); Policlinico Federico II, Napoli (Mirone Vincenzo); Policlinico S. Orsola – Malpighi, Bologna (Brunocilla Eugenio); Policlinico SS. Annunziata, Chieti (Schips Luigi); Polo Pontino- Ospedale ICOT, Latina (Carbone Antonio); Presidio Ospedaliero " Vittorio Emanuele ", Gela (Condorelli Sebastiano); Policlinico "Vittorio Emanuele", Catania (Morgia Giuseppe); Presidio Ospedale S.S. Pietro e Paolo, Borgosesia (Cipollone Giovanni), Presidio Ospedaliero Carlo Poma, Mantova (Dall'Oglio Bruno) Presidio Ospedaliero CTO – Unità Spinale Struttura di Neuro Urologia, Torino (Carone Roberto); Presidio Ospedaliero di Brescia (Simeone Claudio); Presidio Ospedaliero di Busto Arsizio (Buizza Carlo); Presidio Ospedaliero di Pescara (Renzetti Roberto); Presidio Ospedaliero Mazzini, Teramo (Vicentini Carlo); Presidio Ospedaliero Occidentale, Castellaneta (Di Lena Sebastiano); Presidio Ospedaliero Perrino, Brindisi (Brigante Salvatore); Presidio Ospedaliero S. Andrea, Vercelli (Cipollone Giovanni) ; Ospedale S. Maria del Prato, Feltre (Xausa Daniele); Villa Pini D'Abruzzo, Chieti (Marascia Gabriele)

