

Sexual disorders in men suffering from hypertension and their possible correction

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The investigation of the effectiveness of the combined therapy with sildenafil, sildenafil and tivortin, sildenafil, tivortin and LNP-therapy was carried out in 120 hypertensive patients with erectile dysfunction. The patients were divided into several groups. Group I (25 patients) got therapy with inhibitors of phosphodiesterase of 5 type (sildenafil) on demand; Group II (25 patients) got sildenafil in a dose of 50 mg every other day; Group III (25 patients) – sildenafil in a dose of 50 mg every other day + arginin; Group IV (25 patients) – sildenafil + arginine + LNP therapy; Group V (20 patients) was a group of comparison.

The final estimation of the effectiveness of complex therapy in a month showed good and perfect results in 96,0% of patients of Group IV and 84,0% of patients of Group III. Poorer results were revealed in patients of Group I and Group II. In Group V indexes didn't change but in 2 patients (10,0%) results worsened.

On the basis of carried out investigation it was established that arginin and LNP therapy improved treatment.

Key words: *erectile dysfunction, IIEF, sildenafil, arginin, LNP therapy.*

Erectile dysfunction (ED) is a typical complication of an arterial hypertension (AH) which among other more studied complications such as: micro- and macroangiopathy, retinopathy etc. often causes damage to patients' health and also initiates and keeps a depression. It was established that in 80% of cases it occurs due to various organic substances and 20% of cases constitute psychological factors. From all etiological and organic factors of sexual disorders 70% of cases constitute a vascular erectile dysfunction. Such percentage demands the search of prolonged, safe and effective treatment of ED with the following cardiopathology.

In hypertensive patients NO production is low, which is a vasodilator released from endothelium of vessel cavernous tissue in a sexual stimulation. In turn, NO causes an increase of cyclic guanosine monophosphate level of blood vessels' smooth muscles of penis. It causes blood flow and erection. The reverse effect is detumescence, which occurs as a result of cyclic guanosine monophosphate breakdown in the cavernous tissue under the influence of enzyme of phosphodiesterase of type 5 (PDE 5). That's why, sildenafil is used for the treatment of ED.

In a range of the controlled investigations the safety, good tolerance and high effectiveness of sildenafil use for more than 3700 cardiac patients aged 19–87 were proved. This medication was the first widely used in clinical practice.

Due to prognostic data of experts in the nearest 15 years a number of patients with ED will increase intensively. The spread of the given pathology requires the search of new methods of diagnostics and improvement of ED treatment. Some patients which got sildenafil monotherapy didn't notice positive results. Such patients undergo LNP therapy, therapy with intracavernous injections and surgery. Lack of efficacy, contraindications and side-effects of medicines which are in the disposal of an andrologist for ED treatment initiates the research of new pharmaceuticals and carrying out of the complex therapy schemes on the basis of the well-known medications. The promising way is a simultaneous effect on various stages of etiology and pathogenesis of ED with the combined therapy. Positive effect of a simultaneous prescription of medications of various groups intensifies

synergic effect of the common positive one and allows to reduce the dose of inhibitors PDE 5 and their side-effect (in patients with an accompanied cardiac pathology).

The objective: the aim of the research is to investigate the effectiveness of combined therapy with sildenafil, tivortin and LNP therapy in hypertensive patients with ED.

PATIENTS AND METHODS

The examination and complex therapy of 120 hypertensive patients with ED were carried out. The patients were divided into several groups such as: Group I (25 patients), which got therapy with inhibitors of phosphodiesterase of 5 type (sildenafil) on demand; Group II (25 patients) got sildenafil in a dose of 50mg every other day; Group III (25 patients) – sildenafil in a dose of 50mg every other day + tivortin; Group IV (25 patients) – sildenafil +tivortin+LNP therapy; Group V (20 patients) was a group of comparison.

To reveal ED in male with arterial hypertension and to estimate the effectiveness of the used therapy special questioner was used. International Index of Erectile Function – IIEF includes 15 questions. Patient's answer to every question was estimated in scores (from 1 to 5); the higher total number of scores the better sexual function of a male. The subunit of an erectile function included 6 questions, maximal total number of scores was 30, ED was diagnosed in less than 26 scores. The stage of ED sign was established depending on the total number of scores: 21–25 scores – the absence of sexual dysfunctions, 16–20 scores – mild form of ED, 11-15 scores – moderate ED and 5–10 scores – severe ED.

To improve the effectiveness of treatment and to provide prolonged therapy, patients of Group III and Group IV were given tivortin (an active substance arginine, a substrate for NO-synthase, an enzyme which catalyzes nitrogen oxide synthesis in endotheliocytes. The medication activates guanilacyclase and increases the cyclic guanidinmonophosphate level (cGMF) in an endothelium of vessels, reduces the activity and adhesion of leukocytes and thrombocytes to the endothelium of vessels, inhibits of endothelin-1 synthesis, which is a potent vasoconstrictor and stimulator of polyferation and migration of smooth myocytes of a vascular wall. Patients of Group IV were given a conservative therapy with physiotherapeutic procedure – LNP therapy. In this therapy penis was placed in a transparent mini chamber and exhausting was created. In such conditions the inner blood pressure on the vessels' wall is higher than outer one on the created pressure (0,2–0,4 MPa) thus, blood flow to the cavernous tissue occurs. Additional nonfunctional arterial sources and the intensive enrichment of the cavernous tissue with oxygen are revealed. It causes the intensity of NO release. The intensity of cavernous tissue's blood flow blocks a venous flow, which is the main mechanism of the erection rise. Patients of all groups got an individual recommendation on keeping the healthy way of life (proper diet, preservation of day regimen and the regimen of an outdoor walking).

Patients aged 34–65 took part in the investigation got baseline therapy. It was defined that their body weight was 78, 3±5, 2 kg, an index of body weight was 25, 6±2,3 kg/m², arterial hypertension of type II. The signs of an endocrine and psychogenic ED were excluded. The effectiveness of carried out therapy was analyzed in a month of the given therapy. Safe effect of medications due to the absence of side

Index changes of IIEF due to questioning of the patients

IIEF indexes after a month of treatment	Group I, n=25	Group II, n=25	Group III, n=25	Group IV, n=25	Control group, n=25
Varied indexes \geq 50% from primary ones	-	10 (25,0%)	15 (60,0%)	19 (76,0%)	-
good \geq 25-30%	4 (16,0%)	12 (48,0%)	6 (24,0%)	5 (20,0%)	-
satisfactory \geq 10%	21(84,0%)	3 (12,0%)	4 (16,0%)	1 (4,0%)	-
bad \leq 10%	-	-	-	-	2 (10,0%)

effects during the course of treatment was estimated. The effectiveness of therapy was perfect, when indexes of erectile function increased more than 50%, good results were in 25–30% of cases, satisfactory ones in indexes' improvement to 10% and bad results were noticed in the decrease of indexes above 10%.

RESULTS OF INVESTIGATION AND DISCUSSION

All patients finished the investigation and their data were matched in the analyses of the investigation results. As for the complaints of treatment the impaired adequate erections, ejaculation disorder, orgasm disorder and libido decrease were noticed the most often.

In a month from the beginning of treatment the index of EF increased in Group II, Group III and Group IV. But in Group III of patients got sildenafil+arginin and Group IV with sildenafil, arginin and LNP therapy indexes were much better (figure 1). Thus, in patients of Group IV perfect effect of therapy was noticed in 19 patients (76,0%), good – in 5 (20%), satisfactory – in 1 patient (4,0%). In patients of Group III perfect effect was in 15 patients (60, 0%), good – in 6 (24,0%) and satisfactory in 4 patients (16,0%). The final estimation of the effectiveness of complex therapy showed perfect and good results in 96, 0% of patients of Group IV and 84,0% in patients of Group III. Worse results were revealed in patients of Group I i.e. satisfactory

result in 21 patient (84, 0%), perfect result in 10 patients of Group II (25,0%) and in 12 patients (48,0%) satisfactory result were noticed. In Group V (a control group) the indexes of erectile function were not changed. 2 patients (10,0%) had bad results. During the course of treatment side effects were not revealed in four groups of patients.

Thus, the obtained data show much effect of complex treatment of male with erectile dysfunction, which suffer from arterial hypertension, including tivortin and LNP therapy. With LNP therapy the treatment effect of arterial erectile dysfunction is notably improved. The effectiveness of this treatment scheme shows antihypoxic and antioxidant action of tivortin. Thus, the role of NO in a genesis of ED in hypertensive patients takes an important part. LNP therapy contributes to the defining of new non-functional sources of arteries, and intensive enrichment of cavernous tissue with oxygen takes place and it contributes to NO release.

CONCLUSIONS

The use of tivortin and LNP therapy in addition to sildenafil in hypertensive patients with ED allows to improve the effectiveness of treatment and such therapy may be recommended for the wide use.

Outlook of investigations. Further investigations allow improving the results of treatment in hypertensive patients with ED.

**Комбінована терапія еректильної дисфункції у пацієнтів з артеріальною гіпертензією
Є.А. Литвинець, О.Р. Вінтонів**

Проведено дослідження ефективності комбінованої терапії силденафілом; силденафілом та тівортіном; силденафілом, тівортіном та ЛВТ-терапією у 120 хворих з еректильною дисфункцією на тлі АГ. Хворі були поділені на групи: I група (25 пацієнтів) – отримували терапію інгібіторами фосфодіестерази-5 (силденафіл) на вимогу; II група (25 пацієнтів) отримували силденафіл у дозі 50 мг через день; III група (25 пацієнтів) – силденафіл 50 мг через день + аргінін; IV група (25 пацієнтів) силденафіл + аргінін + ЛВТ-терапія; V група (20 пацієнтів) – група порівняння.

Заключне оцінювання ефективності комплексної терапії через 1 міс довело відмінний і добрий результати у 96,0% пацієнтів IV групи і в 84,0% пацієнтів III групи. Значно гірші показники виявлені у пацієнтів I та II групи. У контрольній групі показники еректильної функції не змінилися, а у 2 (10,0%) пацієнтів результати погіршилися. За результатами проведеного дослідження встановлено, що терапія з включенням у схему лікування аргініну та ЛВТ-терапії дозволяє значно покращити результат лікування.

Ключові слова: еректильна дисфункція, ПЕФ, силденафіл, тівортин, ЛВТ-терапія.

**Комбинированная терапия эректильной дисфункции у пациентов с артериальной гипертензией
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Проведено исследование эффективности комбинированной терапии силденафилом; силденафилом и тивортином; силденафилом, тивортином и ЛОД-терапией у 120 больных с эректильной дисфункцией на фоне АГ. Больные были разделены на группы: I группа (25 пациентов) – получали терапию ингибиторами фосфодиэстеразы-5 (силденафил) по требованию; II группа (25 пациентов) получали силденафил в дозе 50 мг через день; III группы (25 пациентов) – силденафил 50 мг через день + тивортин; IV группы (25 пациентов) силденафил + тивортин+ЛВТ-терапия; V группа (20 пациентов) – группа сравнения. Заключительная оценка эффективности комплексной терапии через 1 мес показала отличный и хороший результаты у 96,0% случаев IV группы и у 84,0% пациентов III группы. Значительно хуже были показатели у пациентов I и II группы. В контрольной группе показатели эректильной функции не изменились, а у 2 пациентов (10,0%) результаты стали хуже. По результатам проведенного исследования установлено, что терапия с включением в схему лечения тивортина и ЛОД-терапии позволяет значительно улучшить результат лечения.

Ключевые слова: эректильная дисфункция, ПЕФ, силденафил, аргинин, ЛВТ-терапия.

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