

Male Sexual Dysfunctions and Multimedia Immersion Therapy (Follow-Up)

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ABSTRACT

The aim of the study was to evaluate the efficiency, after 1 year, of combined use of psychodynamic psychotherapy integrating virtual reality (VR) for the treatment of erectile dysfunction (ED) and premature ejaculation (PE) in 160 heterosexual males who had neither any prior sexual therapy nor had made use (either before, during or after therapy) of any specific pharmaceuticals for the treatment of primary sexual dysfunction. All subjects had given their informed consent. After a clinical diagnosis in an andrologic center, 50 presumably psychological ED (average age 43.7 years), 60 mixed ED (53.9 years) and 50 primary PE (39 years) who suffered these problems over 6 months were undergoing a cycle of 12 sessions, over a 25-week period, of psychotherapy, integrating an audio CD and helmet with miniature television screens that projected specially designed CD-ROM program on the ontogenetic development of male sexual identity. The clinical follow up was done after 6 and 12 months after the cycle. After one year, the overall partial (two times out of three) and complete positive response rate for psychological ED was 75%, for mixed ED was 47% and for PE was 54%. We considered drop-out cases as only before the 7th session of the treatment cycle, the drop-outs after session 7 and the patients that did not show up for follow-up are counted as negative results. Two patients reported nausea and one, vertigo during the first 15-min virtual reality experience. Considering the particular way that full-immersion virtual reality involves the subject who experiences it, we hypothesized that this methodological approach could speed up the therapeutic process. The evidence that positive results persist over time allows us to hypothesize that certain changes in cerebral function can be possible and that these changes are correlated to favorable sexual performance in the male.

INTRODUCTION

WITH REGARD TO THE TREATMENT of male sexual dysfunctions, commonly referred to as impotence or ED—"a persistent or recurrent inability to attain, or to maintain, until completion of sexual activity, an adequate erection"¹—and PE—"persistent or recurrent onset of orgasm and ejaculation with minimal sexual stimulation before, upon, or shortly after penetration and before the person wishes it"²—

our research group decided to associate the use of psycho-dynamic psychotherapy with multimedia methods with a view to obtaining faster, better results. After various pilot studies, we found that VR was the best approach. In fact, when the specially designed program was used, VR acted on the brain at various levels. This effect was confirmed by brain positron emission tomography (PET) scans.³

The treatment program described in this paper is repeatable and enables tangible results to be

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obtained relatively quickly. We believe that our research can offer sex therapists and urologists a new approach to treating sexual disorders.^{4,5}

Moreover, this therapeutic design can be used by any psychotherapist and can be combined with medication prescribed by a urologist. In our experience,⁶ this combination considerably reduces the drop-out rate compared to cases using medical treatment alone and, furthermore, could also reduce the risk of "addiction" to drugs in order to achieve desired sexual performance.

This new report deals with the results obtained on 160 males with sexual dysfunctions at the end of the therapeutic program and after follow-up at 6- and 12-month intervals after treatment.

MATERIALS AND METHODS

This study was conducted on heterosexual males who had consulted their urologists because they had been affected by sexual dysfunction for more than 6 months. They had not undergone any prior sexual therapy nor had they used any specific prescribed pharmaceuticals before, during, or after the therapeutic cycle of treatment. All subjects gave their informed consent.

After collecting their medical histories, a physical examination and other diagnostic procedures in an andrological center were carried out. (For ED cases, this included penile ecocolor Doppler involving the intracavernous injection of a vasoactive drug, a Rigiscan test of nocturnal penile tumescence and specific laboratory tests.) The patients were then divided into two groups:

- Group I included patients who had been suffering from ED.
- Group II contained those affected by primary PE.

All patients answered our self-administered sexual-activity questionnaire and subsequently also completed the International Index of Erectile Function (IIEF).⁷ This occurred because the IIEF questionnaire was validated after our trial had begun. Moreover, to evaluate patients affected by PE we adhered to the criteria in DSM-IV,² where symptoms of PE had been present for at least 6 months.

Wherever possible, we also took the psychosocial history of the couple, interviewing the partner both before and after the therapy-cycle and during follow-up.

Patients with organic pathologies (including those with major psychiatric disorders or a history of alcohol or substance abuse) severe enough to be

the sole cause of their sexual dysfunction were excluded from the study. Only when the findings of all the above-mentioned investigations were normal was ED classified as being presumably due to psychological factors.

Group I was then divided into two subgroups: IA (presumably purely psychological causes) and IB (mixed causes):

- Group IA was composed of 50 patients (average age 43.7 years) affected by psychogenic ED (when all tests showed normal results);
- Group IB was composed of 60 patients (average age 53.9 years) affected by ED of mixed (organic and psychogenic) origin with, however, no major organic component, major psychiatric disorder or history of alcohol or substance abuse;

Group II was composed of 50 patients (average age 39 years) affected by primary PE.

After a first evaluation phase, to determine their symptoms, all patients in the two groups received psychotherapeutic treatment using the Virtual Reality–Optale Method envisaging a cycle of 12 sessions of psycho-dynamic psychotherapy over a 25-week period integrated with modern full-immersion VR technology involving the use of a helmet that projects three-dimensional images and is interactive via a joy stick, using a VR program which has been developed specifically for therapeutic purposes following the ontogenetic development of sexual identity, with a view to recovering full sexual performance.

The treatment consisted of 12 1-h sessions, initially once a week, and later once every 2 or 3 weeks. Three additional sessions were held with the sexual partner (if any) in order to identify any problems the couple might have had, such as collusion or hostility. The 12 treatment sessions of the Virtual Reality–Optale Method are as follows: the first, baseline session employs acoustic therapy; the second consists of psychotherapy; in subsequent weeks, four acoustic sessions are alternated with six VR experiences; a final discussion is held.

During the acoustic experience using words and music studied specifically for the different phases of evolution, the psychotherapist and patient listen together to a recording of two voices (with background music) that describe pathways through a forest; this phase requires the listener to make choices regarding the situation in which he finds himself.

The patient's reactions, comments and body language are noted,⁸ and the patient later speaks to the psychotherapist about his experience. During the

15-min VR experiences, the patient sits comfortably in a swivel chair and uses a joystick and a stereophonic head-mounted display to interact in a virtual environment (VE). In the VE, some different extendable pathways (similar to the ones described in the first audio session) are opened through a forest, bringing patients back to their childhood, adolescence and later teens, when they first started to become interested in the opposite sex. The musical background in the virtual situation differs in each experience but coincides with the acoustic stimulus the patient receives through the headphones and which refers to the same period of ontogenetic development.

Feeling totally unobserved and in complete privacy, the patient hears, sees and moves along the VR pathway with unlimited movement capabilities. Different situations are presented, with obstacles that the patient has to overcome in order to continue. This VE also includes fragments of non-erotic films, which always relate to the ontogenesis of male sexual identity. Each film clip lasts several seconds and is activated by the patient in response to the same actions, thereby completing the immersion process. The psychotherapist is linked to the patient by headphones to overcome any technical interaction difficulties.

Situations that may directly stimulate a sexual reaction are not evoked by the acoustic and VR experiences.

Apart from sensations of well-being or improved overall condition, only an adequate and complete erection associated with satisfactory sexual activity is regarded as a positive result. At the end of the treatment sessions and at follow-up, patients completed the same self-administered sexual-activity questionnaire made before the treatment, and further clinical assessment was made in the andrologic center. With the IIEF,⁷ we assessed efficacy by using the responses to question 3 (When you attempted sexual intercourse, how often were you able to penetrate your partner?) and question 4 (During sexual intercourse, how often were you able to maintain your erection after you had penetrated your partner?). Responses to question 3 and question 4 were scored from 1 ("almost never/never") to 5 ("almost always/always"), with "no sexual activity" scored as 0.

For those patients affected by PE, we also (as a further confirmation of positive results) asked if the time between penetration and ejaculation was more than 2 min. The partner was interviewed separately, whenever possible, at the end of the cycle and at the follow-up sessions in order to obtain confirmation of the results.

RESULTS

After 25 weeks of cycle of treatment, we obtained the following results:

Group IA—50 ED of psychological origin

- Drop-outs: 5 cases (10%)
- Improvement: 13 cases (26%) (partial positive response)
- Resolution: 25 cases (50%) (complete positive response)
- No result: 7 cases (14%)

(A partial positive response was defined as an increase in positive results, but still less than 66%, two out of three times. This evaluation was applied to the whole study.)

Group IB—60 ED of mixed origin (organic and psychological)

- Drop-outs: 10 cases (17%)
- Improvement: 8 cases (13%) (partial positive response)
- Resolution: 19 cases (32%) (complete positive response)
- No result: 23 cases (38%)

Group II—50 primary PE

- Drop-outs: 13 cases (26%)
- Improvement: 4 cases (8%) (partial positive response)
- Resolution: 24 cases (48%) (complete positive response)
- No result: 9 cases (18%)

(Two patients reported nausea and one reported vertigo during the first 15-min VR experience during the first viewing.)

At follow-up after 6 months, the results for all treated patients, including those failing to obtain results, were as follows:

Group IA—50 ED of psychological origin

- Drop-outs*: 5 cases (10%)
- Improvement: 13 cases (26%) (partial positive response)
- Resolution: 25 cases (50%) (complete positive response)
- No result: 7 cases (14%)

Group IB—60 ED of mixed origin (organic and psychological)

- Drop-outs*: 11 cases (18%)
- Improvement: 10 cases (17%) (partial positive response)

- Resolution: 19 cases (32%) (complete positive response)
- No result: 20 cases (33%)

Group II—50 primary PE

- Drop-outs*: 13 cases (26%)
- Improvement: 1 cases (2%) (partial positive response)
- Resolution: 27 cases (54%) (complete positive response)
- No result: 9 cases (18%)

(*Patients dropping out during the treatment cycle plus patients who did not show up for follow-up.)

At follow-up after 12 months, the results for all treated patients, including those failing to obtain results, were as follows:

Group IA—50 ED of psychological origin

- Drop-outs*: 5 cases (10%)
- Improvement: 13 cases (26%) (partial positive response)
- Resolution: 25 cases (50%) (complete positive response)
- No result: 7 cases (14%)

Group IB—60 ED of mixed origin (organic and psychological)

- Drop-outs*: 11 cases plus 1 patient who died (20%)
- Improvement: 9 cases (15%) (partial positive response)
- Resolution: 19 cases (32%) (complete positive response)
- No result: 20 cases (33%)

Group II—50 primary PE

- Drop-outs*: 14 cases (28%)
- Improvement: 0 cases (0%) (partial positive response)
- Resolution: 27 cases (54%) (complete positive response)
- No result: 9 cases (18%)

After 12 months, the complete positive response rate was 44.4%; the partial positive response rate was 13.7%; the negative response rate was 22.5%; and the drop-out rate was 19.4%. The overall partial and complete positive rate was, therefore, 58%. The overall negative and dropout rate was, therefore, 42%.

Analyzing the Chi-square statistical results, there was a significant difference between the group

made up of patients with positive or partially positive results and the group made up of patients who displayed negative results or who dropped out. It should be underlined that, in the analysis of the variables, no significance was attached to the age of the patients displaying positive results.

CONCLUSION

The aim of this study, which follows on from our earlier research on VR use integrating the psychotherapy for the treatment of ED⁴ and PE,⁵ was to evaluate the therapy efficiency of this method—which uses a repeatable therapeutic protocol—not only at the end of the treatment cycle but above all at follow-up (after 1 year). Having begun to help patients using this method even before IIEF was validated,⁷ in this study we have not separately reported the results obtained before and after the introduction of IIEF but have simply integrated these results into the clinical assessment in order to have an adequately-sized sample.

This treatment is an evolution of the first sex therapy proposed by Masters and Johnson^{9,10} and also takes into account the new, advanced theories of Kaplan,¹¹ Stoller,¹² Money,¹³ Schaffer and Emerson,¹⁴ Bowlby and Ainsworth,^{15,16} and Baldaro Verde.^{17,18}

The treatment follows the hypothesis that sexual identity, which is defined by a multi-factor concept, is acquired in the earliest years of life through a process of identification with the same-sexed parent and is completed by the parent of the opposite sex. It is only consolidated at the end of an often difficult, complex process that includes a fusion of biological, psychological and social elements in a dynamic continuum. The evolving aspect lies in the temporal order in which gender identity, social role and aim emerge. The dynamic aspect involves the risk of one of the pillars of sexual identity being damaged or even destroyed. Therapy is required in such cases: sexual identity must be rebuilt and symptoms decoded (in our opinion this is also true for cases of organic ED in that the sexual dysfunction can spark off and maintain a vicious circle).

In this critical process, the VR method rapidly enables the patient to evoke memories and emotions that are worked through with the psychotherapist at the end of the session whilst the patient is still under the influence of the interactive experience, thus accelerating the process of working through events and sensations personally.

This allows the patient to enter the sphere of associations of sexual dysfunction that takes much

longer when only conventional psychotherapy sessions are used.

In the VR experience, the patient follows pathways that accelerate a psychodynamic process that eludes cognitive defenses and directly stimulates the subconscious, and, consequently, everything else related to his experience in the sexual sphere. The obstacles that lead to sexual dysfunction are thus brought to light. As the patient becomes aware that the causes of his sexual dysfunction can be modified, he acquires—under the therapist's guidance—a further means for taking part in the healing process.

On the basis of the neuro-psychological work of Damasio,¹⁹ we suggest that, by interacting with his own senses through VR, the patient generates input that acts on phylogenetically lower brain centers through the neocortex to modify certain associations. Disinhibition of the sex drive in the Freudian sense^{20–23} is the likely result.

The positive effects of this therapy were lasting, suggesting that this method accelerates the healing process by re-opening old brain pathways or consolidating them. This assumption is based on studies with the marine snail *Aplysia californica*,^{24–29} and it implies that new, rarely used inter-synaptic connections characterized by a particular magnitude of activation³⁰ may be established so that new mnemonic associations favoring satisfaction of natural drives can flow.

One could therefore claim that this therapeutic approach, using VR, enables changes in the functional metabolic activity of specific brain areas connected with the erection mechanism, a finding confirmed by tests performed using brain PET before and after therapy³; it also supports the hypothesis that a male sexual brain algorithm may exist.³¹ Moreover, other follow-up study using the brain PET identified certain areas of the brain specifically involved in the mechanism of visual sexual stimuli.³²

Among the dropouts, there were definitely patients who had not benefited from the treatment and who preferred not to answer the psychotherapist's telephone invitation to come back for a check-up. This fact, together with identification of those patients who could derive greater benefit from the use of this method integrated with pharmacotherapy at a precise moment in the therapeutic cycle, is to be the subject of future investigations.

However, the relatively good percentage of positive results that was maintained after a 1-year period and the transformation of PE cases that were initially considered as partially positive and then re-

solved completely (as if to suggest that more time were required by certain patients) apparently supports this psychotherapeutic method integrating VR with other psychotherapies for curing male sexual dysfunctions (ED and PE), with the aim of accelerating the healing process and maintaining a good percentage of positive results after a period of time.

Currently, we are working to make available innovative tools (telemedicine and portable tools) for the treatment of patients with ED and PE.

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