Vol. 2, No. 4, 227-229 Autumn 2005
Printed in IRAN

News

The Second Urology and Nephrology Research Festival (Avicenna)

The Urology and Nephrology Research Center (UNRC) began its activity in 1999. The UNRC works toward its mission by conducting studies at national level and by supporting and coordinating with researchers, research institutions, universities and academic centers, and other related settings. In accordance with the responsibilities of this center, a research festival is designated to be held yearly, and the first Urology and Nephrology Research Festival was held in 2004 by the UNRC. The Second Urology and Nephrology Research Festival was held in December 9, 2005 and the best research projects in the field of urology and nephrology were selected and appraised. The underlying objectives of this festival are firstly to encourage the research in urology and nephrology fields; secondly to appreciate the researchers' efforts, and thirdly, to introduce the them and their findings to the scientific societies.

Juries evaluating in methodology, subject, creativity and problem solving first carefully assessed the research projects. Scores were gathered and after standardization and sorting the projects, the final decision was made. The winners were invited to take part in the award ceremony at Imam Ali conference hall in Shaheed Beheshti University, Tehran.

This year, Dr Seyed Hossein Riazimand from Heidelberg University, was the first prize winner of this festival for his work "A Rat Model for Studying the Effects of Sacral Neuromodulation and Interaction between Neurotransmitter Antagonists and Sacral Neuromodulation in Rats with Chronic Hyperactive Bladder." More details of this study are described later on in this report.

The second winner was Dr Mousarreza Hadjzadeh. He is associate professor of physiology in Mashhad University of Medical Sciences. The ethanolic extract of Nigella Sativa was the subject of his research. Concerning its anti-analgesic and anti-inflammatory effects, and the increasing effect on glutathione in kidney, he studied a rat model to investigate the effect of Nigella Sativa on kidney stones in rats. He has found that the number of calcium oxalate deposits in the kidneys are reduced when Nigella Sativa is added to the drinking water of rats.

Also, the best dissertation in the field of urology was selected by the jury and Dr Amir Haji Mohammad Mehdi Arbab, resident of urology in Shohada-e-Tajrish Hospital, won the prize. He investigated the presence of human papillomavirus infection in patients with bladder tumor of different local stages and grades and in a control group. He has conducted this study under the supervision of Dr Mohammadreza Barghi, assistant professor of urology in Shohada-e-Tajrish Hospital.

The First Prize Winner

Seyed Hossein Riazimand was born in 1963 in Zunuz, Iran. He graduated from the University of Mainz in Germany in 2001, with a PhD degree in natural sciences. Now he continues his scientific activity in the *Institut für Anatomie und Zellbiologie III* at the University of Heidelberg. It is indeed a great honor to recognize Dr Riazimand for all his great effort as an Iranian scientist and to bestow upon him the 2005 first rank Urology and Nephrology Research Award.

Dr Riazimand and his colleague, Dr Siegfried Mense, have carried out an animal study to evaluate the electrical stimulation of the sacral nerves with electrodes in the sacral foramina, namely sacral neuromodulation. They developed an animal model in which the effect of sacral neuromodulation on a chronic hyperactive urinary bladder can be studied. Their results were published in 2004 in BJU International.[1] In the next step, they introduced a modified rat model to investigate the interactions between antagonists of spinal neurotransmitters and the effect of sacral neuromodulation (Figure 1).

Riazimand and Mense's experiments were based on the hypothesis that sacral neuromodulation releases neurotransmitters in the spinal neurons, and consequently reduce the bladder contractions. If one of these neurotransmitters is involved in the neuromodulatory effects, intrathecal administration of an antagonist should reduce the effects of neuromodulation. They used 39 female rats and induced cystitis in 24 by instillation of turpentine oil into the bladder (Figure 2). The other 15 rats served as controls. All rats survived for 10 days and thereafter, the induced cystitis was considered chronic. Then, they anesthetized the rats and introduced a catheter into their bladders. To record bladder contractions, they connected a pressure transducer to the catheter. The rats were mounted in a spinal frame and the sacral foramina from S1 to S3 were surgically exposed. Two stimulating cathodes were placed in the foramina of S1 bilaterally (Figure 3). For topical spinal (intrathecal) administration of the antagonist or blocker, respectively, a laminectomy from vertebrae L6 to T12 was performed with a plastic ring. They termed this technique of intrathecal administration *spinal superfusion*. In rats with both inflamed and intact bladder, they first filled the pool with cerebrospinal fluid and applied sacral neuromodulation. Then, they exchanged the pool contents with *memantine*, an antagonist of N-methyl-D-aspartate (NMDA) receptors; *6-cyano-7-nitroquinoxaline-2,3-dione disodium salt (CNQX)*, an antagonist of α-amino-3-hydroxy-5-methyl-4-isoxazolepropanoic acid/kainite receptors; and *L-N-nitroarginine p-nitroanilide (L-NAPNA)*, a blocker of neuronal NO syntase. They tested only one antagonist in each rat and sacral neuromodulation was repeated for 2 minutes.

The results of this study were as follows: memantine and L-NAPNA paused the cystitis-

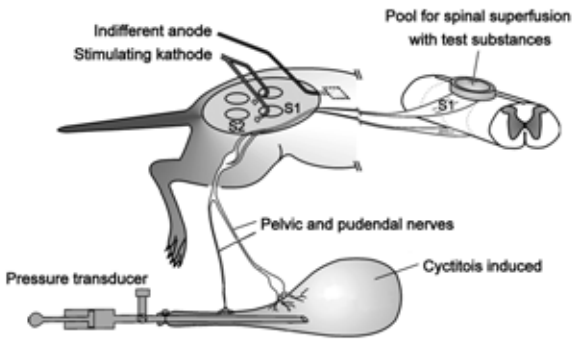

Fig. 1. The modified model: the right side shows the pool for spinal superfusion of the test substances on the dorsal surface of the spinal segment S1; on the left side the arrangement of the electrodes for sacral neuromodulation is depicted.

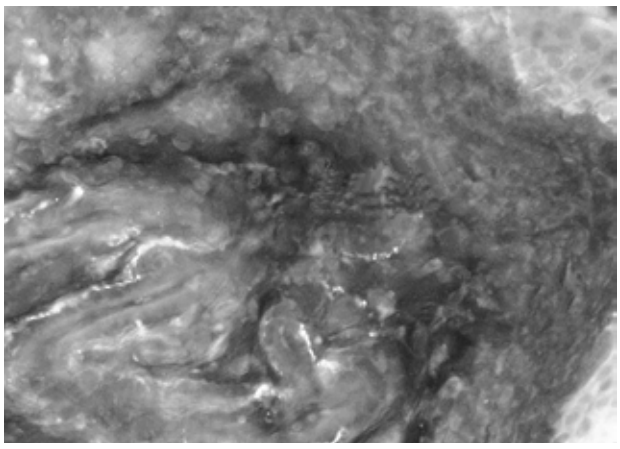

Fig. 2. Cystitis induced by instillation of bladder with 2.5% turpentine oil: calcitonin gene-related peptide-ir nerve endings exhibited an inflammation-induced increase in innervation density (immunofluorescence).

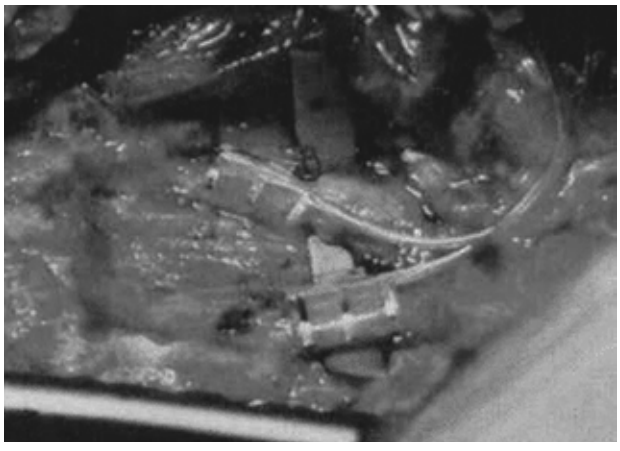

Fig. 3. Two cuff electrodes are attached to S1 sacral spinal nerves, intraoperatively.

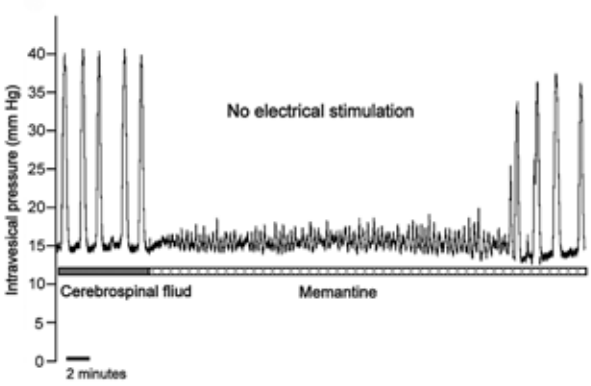

Fig. 4. Effect of memantine superfusion on cystitis-induced contractions

induced bladder contractions for 4 minutes and 37 minutes, respectively (Figure 4). The cerebrospinal fluid and CNQX caused a insignificant pause in contractions. Electrical sacral modulation with no antagonists also transiently abolished the bladder contractions; at the highest intensity used, the pause was 2 to 3 minutes. Superfusion of the spinal cord with CNQX reduced this effect of neuromodulation significantly, whereas memantine had no influence, and L-NAPNA increased the neuromodulation-induced pause.

Dr Riazimand and his colleague have suggested that non-NMDA receptors are involved in the effects of sacral neuromodulation, whereas NMDA receptors appear to have no role. Nitric oxide is essential for maintaining the chronic hyperactive state of the urinary bladder. The report of this study is published in BJU international.[2]

References

1. Riazimand SH, Mense S. A rat model for studying effects of sacral neuromodulation on the contractile activity of a chronically inflamed bladder. BJU Int. 2004;94:158-63.
2. Riazimand SH, Mense S. Interaction between neurotransmitter antagonists and effects of sacral neuromodulation in rats with chronically hyperactive bladder. BJU Int. 2005;96:900-8.