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Interview with the Expert

Closing the Gender Gap in Neuro-Urology Academic Conferences

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For this issue's Neuro-Urology News Interview with the Expert, I had the opportunity to interview Dr. Véronique Phé. Dr. Phé is Professor of Urology at Sorbonne University, based in Paris, in Tenon Academic Hospital. She is former Chair of the EAU Young Academic Urologist Functional Urology Group, EAU Guidelines on Female Lower Urinary Tract Symptoms panel member, EAU European Urological Scholarship Programme (EUSP) board member, Chair of the Neuro-Urology Committee of the French Association of Urology (AFU), Vice-President of the French College of Urology and General Secretary of the GENULF (French-speaking Group of Experts in Neuro-Urology). She has published over 150 peer-reviewed scientific papers, and has clinical interests in functional urology and neuro-urology, and basic science interest in the pathogenesis of urothelial carcinoma in the neurogenic bladder. Here, we discuss her group's recent paper "Gender representation at scientific congresses: focus on functional and female urology – a study from the EAU Young Academic Urologist Functional Urology Group". Below is our discussion, edited for length and clarity.

Dr. Glenn Werneburg: What is known about gender inequity at scientific conferences in general? Is the same true in urology conferences? What about functional and neuro-urology conferences?

Dr. Véronique Phé: In general, we know there are more women involved in academic studies now than ever. Even if there are more women involved in academic studies, we see there are not more women represented at academic conferences. Functional urology is often known as a female subspecialty. We observe from our colleagues, that many patients with oncological cases are referred to male urologists. And most of the functional cases, UTI for example, are referred to female urologists. However, even if this is so, women representation at functional urology academic conferences remains lacking. Thus, we wanted to investigate women's representation in academic activities at the conferences: in the sessions, in moderating and organizing roles, etc. That's why we developed this study. And what we've noticed is that, even though this sub-specialty may be female-predominant clinically, there is more representation of men than women at academic conferences in this field. During conferences, there are more chairmen than chairwomen. There are more technical sessions presented by men than by women. And women were more likely to have presenting and moderating roles in soft-skills sessions, but were often completely excluded from the technical sessions in these roles. Those were our observations.

GW: How did you design the present study, and what did you hypothesize?

INUS Calendar

INUS Course
3rd Course of Reconstructive Surgery for Spinal Cord Injury Patients
Santiago, Chile
March 22-April 23, 2024

INUS Course on Neuro-Urology Updates
Kochi, India
April 6-7, 2024

INUS Course at EAUN Meeting
Paris, France
April 6-8, 2024

INUS Session at Annual Congress, Urologic Society of India
Hyderabad, India
April 19-20, 2024

INUS International Course on Neuro-Urology
Bangkok, Thailand
June 27-28, 2024

INUS International Course on Neuro-Urology
Medellin, Colombia
September 27-28, 2024

INUS Annual Congress 2025
Zermatt, Switzerland
January 16-18, 2025

VP: This study came from the Young Academic Urologists group, a functional group of the European Association of Urology that I chaired two years ago. The people from the group came from different countries: Italy, Germany, Turkey, France, and others. So I asked the members to do a retrospective study investigating all the speakers and moderators of functional urology conferences in their countries, but also the EAU and other international conferences, and to determine the proportion of women in speaking, moderating, and other leadership roles. And so we reported that the gender gap between men and women during functional urologic congresses – national or international – was about 30%. Even though there are more women in the subspecialty, the gender gap was 30% in favor of men.

GW: What are the implications of this study and what can be done with these results?

VP: This is to raise awareness in people who organize conferences in societies, that this gap exists. I have started to speak about it because I belong to several boards within the French Association of Urology within the European Association of Urology. Within the EAU, I have the responsibility to provide a list of women, who can be moderators, perform semi-live surgeries, etc. The role is to raise awareness and promote and improve the exposure of women.

Each time we gather to organize a scientific conference, my group proposes women's names within these technical sessions for chairman, moderator, and other leader positions. Now, I think that things will change.

Now, our colleagues – men and women – are aware of the gap, and now they try to be very careful to include women. They say, "OK, each session there must be a woman." Of course, a competent one, but that's not the question. We've never said, there must be a man, but he must be competent. But, when it's regarding a woman, it's often said, "OK, but she has to be competent". This is an example of discrimination.

GW: What else can be done to reduce this inequity, particularly even before the speakers and panelists are chosen?

VP: We have to increase the representation. When medical students or young residents don't see women standing on the stage, doing research, speaking, being a key opinion leader, they cannot project themselves into those roles in the future. They cannot see themselves in that way in the future. But if they are exposed to female representations, they will say, "OK, it's possible. Even if she's small, even she's not 100% white, even if she comes from a different origin, it is possible." So it's really a matter of image and representation so that people can project themselves into these roles in the future. And this must start very early in the career – in medical school or earlier.

GW: What are your team's next steps? Do you have any additional efforts in studying this area or are you focusing on the implementations now?

VP: We need to do the same studies in two years to see whether things have changed. Will the gender gap be reduced at this point? We have to continue improving the place for women in scientific committees and other scientific areas.

GW: What advice do you have for junior INUS members and others interested in starting a career as an investigator with a urological focus?

VP: First, we have to encourage them because it's not the topic with the most exposure. Everyone is exposed to on-call urology and stones, for example. So, if there are people interested in neuro-urology and functional urology, we have to help them. This is the first thing. The second thing is that they have to identify very early what they want to do in their career: to be in an academic position, or if they want a private practice. If they want an academic career, this has to be built very early and a mentor should be identified early. A mentor is one person – it can be a man or a woman, this does not matter. The mentor is already a neuro-urologist and can really expose these young trainees to different academic activities and conferences, to help them make connections with others, present their work, etc. The second is that you need a coach. A coach is not the mentor. A coach can be a urologist or non-urologist. It can be a friend, or someone from another specialty who can give some advice, but he or she is not directly involved in what you do every day. And it's really great to have both a mentor and a coach.

Further Reading:

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Literature Review: fMRI pitfalls

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Introduction

Since its inception in the early 1990s, functional magnetic resonance imaging (fMRI) has significantly advanced our understanding of the functional organization of the human brain. In its most-commonly-applied form, fMRI utilizes the neurovascular coupling to detect blood-oxygen-level-dependent (BOLD) signal, a correlate of neuronal activity.

In the field of neuro-urology, neuroscientists adopted this technique to explore the supraspinal control of the lower urinary tract (LUT), largely replacing positron emission tomography (PET) due its non-invasive nature and superior spatial resolution. Studies utilizing BOLD-fMRI have not only revealed the brain regions involved in LUT control (the brain-bladder network) but have also investigated their alterations in pathology and in response to interventions such as transcutaneous electric stimulation.

Despite the impact it has already made in neuro-urology research, fMRI is not without pitfalls and challenges, and a failure to adhere to best practices can limit the reproducibility and validity of findings. These concerns, along with recommendations, have already been discussed in detail by (Mehnert et al., 2020). As a neuroimaging specialist, I would like to highlight some pitfalls and considerations in fMRI, drawing on recent studies from the field of neuro-urology as examples.

Considerations

First, it is important to recognize that the observed neuronal activity in BOLD-fMRI (referred to as "BOLD activity" or "fMRI activity") in response to an experimental condition, such as bladder filling, is inherently linked to statistical concepts. Essentially, in each volumetric pixel (voxel) of the region of interest, the investigator assesses how closely the signal resembles the expected signal if the neuronal population within that voxel were active in response to the experimental paradigm, resulting in a p-value. For example, a p-value of 0.01 indicates that there is only a 1% chance that the signal of the particular voxel resembles the expected signal by chance; thus, it is reasonable to conclude that the voxel contains neurons that activated during the task. However, considering that the brain contains a vast number of voxels (50,000 – 150,000 at typical resolutions), using a threshold of $p<0.01$ would result in 500-1500 "activated voxels" (false positives) by chance alone! In practice, this number would be even higher, as reports indicate that the false positive rates in neuroimaging studies are often much higher than nominal values.

In a recent study, Kreydin et al. reported that patients who developed storage LUT dysfunction after a stroke exhibited increased BOLD activity during voiding initiation in areas including the periaqueductal grey, insula, lateral prefrontal cortex, and motor cortex after undergoing 24 biweekly session of transcutaneous spinal cord stimulation. These results suggest that neuromodulation might have a sustained effect on brain networks underlying LUT control in patients with LUT dysfunction. The authors applied a liberal threshold of $p<0.01$ (uncorrected) with a minimal cluster size of 25 voxels, which increases the likelihood that some of the reported findings are false positives.

In another recent study, Wöllner et al. investigated functional connectivity, i.e., how different brain regions within the brain-bladder network are functionally linked in terms of their activity patterns, at rest and during transcutaneous tibial nerve stimulation (TTNS) in healthy volunteers. During TTNS, the participants were found to have altered functional connectivity in areas involved lower urinary tract control, including increased connectivity between the inferior frontal gyrus, posterior cingulate gyrus, and middle temporal gyrus with the precuneus as the central receiving node, and decreased connectivity in the cerebellum, hippocampus, and parahippocampal areas. These results point to an involvement of supraspinal networks in the effect of TTNS. In this study, the authors used a more conservative threshold of $p<0.05$ (familywise error corrected to control for the number of voxels in the brain) with a minimal cluster size of 200 voxels, which makes the findings less susceptible to false positives. To effectively control for false positives, it has been recommended to use a threshold of $p<0.001$ (uncorrected with an additional cluster correction) or $p<0.05$ using false discovery rate or familywise error correction.

The fMRI paradigm often involves settings that are unusual to participants, such as bladder filling through a catheter or voiding in the confined and noisy space of an MRI scanner, which could potentially impact brain activity. This presents a challenge because differences observed in longitudinal studies might be due to participants habituating to these unusual settings. For example, in the study of Kreydin et al., the differences between the pre- and post-treatment scans might be partly explained by habituation effects. Therefore, it is important to account for these effects, for instance, by including control participants who undergo the same measurements at all time points.

Finally, it is often assumed that the observed BOLD activity indicates increased neuronal activity in terms of an increased firing rate. However, according to our current understanding, this assumption is not necessarily true. Experiments have shown that BOLD activity is more closely associated with the input a neuronal population receives rather than the output it produces. This means that both increased excitatory or inhibitory input to a neuronal population could lead to BOLD activity in that location. Therefore, a working hypothesis of the underlying networks is necessary to properly interpret BOLD-fMRI findings.

Conclusion

In conclusion, functional MRI is the best tool we have for gaining insights into large-scale brain-bladder networks with high spatial resolution. Nonetheless, the complexity and pitfalls inherent to fMRI underscore the importance of close collaboration among neuroscientists, MR physicists, and clinicians.

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