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## INVITED EDITORIAL

Male Fertility

# Varicocele and male infertility: current concepts and future perspectives

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**This Special Issue of *Asian Journal of Andrology* is fully dedicated to the thematic area of Varicocele, which has been one of the most controversial issues in the field of Urology, Andrology, and Reproductive Medicine. Recognized as a clinical entity for over a century, varicocele from Latin: *varix* (dilated vein) and from Greek: *kele* (tumor) still elicits heated debate among scientists and clinicians on an arguable negative effect on male fertility and gonadal function and has fueled thousands of scholarly articles since its first report in the 18<sup>th</sup> century.**

*Varicocele and Male Infertility: Current Concepts and Future Perspectives* contains the seminal work of renowned scientists and clinicians from 15 countries on five continents. In 29 chapters, comprehensive reviews on the pathophysiology,<sup>1–3</sup> epidemiology,<sup>4</sup> diagnosis,<sup>5–8</sup> and management<sup>9–20</sup> of varicocele are presented; they dissect our current knowledge about varicocele from a multitude of angles. Among them, two systematic reviews critically summarize the clinical practice guidelines and best practice statements for diagnosis and management of varicocele in adults and adolescents.<sup>17,18</sup> Moreover, three meta-analyses summarize the evidence on the effect of varicocele on semen parameters<sup>7</sup> and the role of repairing varicoceles in men with azoospermia<sup>19</sup> and in the male partners of infertile couples that will be subjected to assisted reproductive technology (ART).<sup>20</sup> One of these meta-analyses is of particular interest to all health care providers and

scientists alike because it revisits the effect of varicocele on conventional semen parameters in the face of the latest (fifth) edition of the World Health Organization (WHO) manual for the laboratory examination of human semen.<sup>7</sup> As readers may be well aware of, the newest WHO manual not only changed the reference values for interpreting semen analysis results but also updated the methods for conducting such analyses.

Marmar, whose seminal work on subinguinal microsurgical varicocelectomy lead to a paradigm shift in the way we now treat varicoceles, compiled a historical review of varicocele surgery.<sup>10</sup> Two original articles were included; one presenting novel findings of an association between proteomics signatures in infertile men with clinical varicocele and sperm mitochondrial dysfunction,<sup>3</sup> and another commenting on the usefulness of antegrade scrotal sclerotherapy as an alternative method for varicocele treatment to the commonly used open surgical repair.<sup>12</sup> In addition, six commentary articles written by experts with vast clinical experience discuss challenging clinical conditions faced by health care practitioners dealing with males with varicocele.<sup>21–26</sup> Furthermore, opportune is the review of Chiles and Schlegel, which provides a critical appraisal of the cost-effectiveness of varicocele surgery in the era of ART.<sup>27</sup>

This Special Issue of *Asian Journal of Andrology* includes a multinational authoritative review, including 19 institutions across 12 countries about how to track research impact by selecting the appropriate metrics.<sup>28</sup> In the years to come, it will be interesting to learn how these various bibliometrics reflect the impact of this Special Issue of *Asian Journal of Andrology*. Equally interesting will be to know if the predictions of Lamb and Lipshultz's group come true with regards to

the future use of molecular biomarkers for the diagnosis and management of adolescents and adults with varicocele.<sup>29</sup>

We are very fortunate indeed that Thomas Jr. accepted our invitation to write the foreword.<sup>30</sup> His humbleness and gentle manners hide a giant who contributed greatly to the field of male infertility, including varicocele and microsurgery. Tony Thomas has taught a legion of young doctors from so many different places and countries for so long, making it impossible to measure by any scientific means the impact of his work.

We as guest editors are grateful to the Chief Editor and the Editorial staff of the *Asian Journal of Andrology* for their impeccable support. Ms. Danqing (Dan) Ren (Scientific Editor), who was in-charge of our Special Issue, was one of the best editorial professionals we could have asked for. She was diligent, organized, hardworking, and a very understanding individual. We would like to thank her and the members of her team for their enormous dedication in compiling this Special Issue. This Special Issue is recommended to students and researchers in the biological and medical sciences and clinicians involved in the management of infertile couples, including urologists, andrologists, gynecologists, embryologists, and reproductive specialists interested in following the exponential growth in the knowledge of varicocele. Due to the multidisciplinary nature of varicocele as a cause of male infertility, unsolved problems present themselves and the opportunities for advancement continue to expand. We hope our readers will appreciate this Special Issue of *Asian Journal of Andrology* and share our excitement in the study of varicocele.

## REFERENCES

- 1 Cho CL, Esteves SC, Agarwal A. Novel insights into the pathophysiology of varicocele and its

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- association with reactive oxygen species and sperm DNA fragmentation. *Asian J Androl* 2016; doi: 10.4103/1008-682X.170441.
- 2 Camargo M, Intasqui P, Bertolla RP. Proteomic profile of seminal plasma in adolescents and adults with treated and untreated varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.168788.
  - 3 Agarwal A, Sharma R, Samanta L, Durairajanayagam D, Sabanegh E Jr. Proteomic signatures of infertile men with clinical varicocele and their validation studies reveals mitochondrial dysfunction leading to infertility. *Asian J Androl* 2016; doi: 10.4103/1008-682X.170445.
  - 4 Alsaikhan B, Alrabeeh K, Delouya G, Zini A. Epidemiology of varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172640.
  - 5 Belay RE, Huang GO, Shen JK, Ko EY. Diagnosis of clinical and subclinical varicocele: how has it evolved? *Asian J Androl* 2016; doi: 10.4103/1008-682X.169991.
  - 6 Kruger TF. Critical appraisal of conventional semen analysis in the context of varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.168691.
  - 7 Agarwal A, Sharma R, Harlev A, Esteves SC. Effect of varicocele on semen characteristics according to the new 2010 World Health Organization criteria: a systematic review and meta-analysis. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172638.
  - 8 Majzoub A, Esteves SC, Gosálvez J, Agarwal A. Specialized sperm function tests in varicocele and the future of Andrology laboratory. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172642.
  - 9 Dabaja AA, Goldstein M. When is a varicocele repair indicated: the dilemma of hypogonadism and erectile dysfunction? *Asian J Androl* 2016; doi: 10.4103/1008-682X.169560.
  - 10 Marmar JL. The evolution and refinements of varicocele surgery. *Asian J Androl* 2016; doi: 10.4103/1008-682X.170866.
  - 11 Halpern J, Mittal S, Pereira K, Bhatia S, Ramasamy R. Percutaneous embolization of varicocele: technique, indications, relative contraindications, and complications. *Asian J Androl* 2016; doi: 10.4103/1008-682X.169985.
  - 12 Crestani A, Giannarini G, Calandriello M, Rossanese M, Mancini M, *et al.* Antegrade scrotal sclerotherapy (ASS) of internal spermatic veins for varicocele treatment: technique, complications and results. *Asian J Androl* 2016; doi: 10.4103/1008-682X.171658.
  - 13 Tiseo BC, Esteves SC, Cocuzza MS. Summary evidence on the effects of varicocele treatment to improve natural fertility in subfertile men. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172639.
  - 14 Samplaski MK, Jarvi KA. Prognostic factors for a favorable outcome after varicocele repair in adolescents and adults. *Asian J Androl* 2016; doi: 10.4103/1008-682X.169558.
  - 15 Rotker K, Sigman M. Recurrent varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.171578.
  - 16 Garg H, Kumar R. An update on the role of medical treatment including antioxidant therapy in varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.171657.
  - 17 Roque M, Esteves SC. A systematic review of clinical practice guidelines and best practice statements for the diagnosis and management of varicocele in children and adolescents. *Asian J Androl* 2016; doi: 10.4103/1008-682X.169559.
  - 18 Shridharani A, Owen RC, Elkelay OO, Kim ED. The significance of clinical practice guidelines on adult varicocele detection and management. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172641.
  - 19 Esteves SC, Miyaoka R, Roque M, Agarwal A. Outcome of varicocele repair in men with nonobstructive azoospermia: systematic review and meta-analysis. *Asian J Androl* 2016; doi: 10.4103/1008-682X.169562.
  - 20 Esteves SC, Roque M, Agarwal A. Outcome of assisted reproductive technology in men with treated and untreated varicocele: systematic review and meta-analysis. *Asian J Androl* 2016; doi: 10.4103/1008-682X.163269.
  - 21 Polackwich AS, Sabanegh ES. Asymptomatic postpubertal male with equally sized normal testicles with palpable left varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.161601.
  - 22 Zhang Y. Asymptomatic postpubertal male with palpable left varicocele and subclinical right varicocele. *Asian J Androl* 2016; doi: 10.4103/1008-682X.169992.
  - 23 Fraietta R, Zylbersztejn DS, Cedenho AP. Asymptomatic male with grade 3 left varicocele and 2 children desiring vasectomy with low testosterone. *Asian J Androl* 2016; doi: 10.4103/1008-682X.164196.
  - 24 Majzoub A, Sabanegh E Jr. Symptomatic male with subclinical varicocele found on ultrasound evaluation. *Asian J Androl* 2016; doi: 10.4103/1008-682X.170864.
  - 25 Hallak J. Asymptomatic male currently not desiring fertility with bilateral subclinical varicocele found on ultrasound examination and borderline semen analysis. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172645.
  - 26 Shen JK, Huang GO, Ko EY. Controversies in varicocele repair: much ado about nothing? *Asian J Androl* 2016; doi: 10.4103/1008-682X.168789.
  - 27 Chiles KA, Schlegel PN. Review of the cost-effectiveness of varicocele surgery in the era of assisted reproductive technology. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172644.
  - 28 Agarwal A, Durairajanayagam D, Tatagari S, Esteves SC, Harlev A, *et al.* Bibliometrics: tracking research impact by selecting the appropriate metrics. *Asian J Androl* 2016; doi: 10.4103/1008-682X.171582.
  - 29 Chiba K, Ramasamy R, Lamb DJ, Lipshultz LI. The varicocele: diagnostic dilemmas, therapeutic challenges and future perspectives. *Asian J Androl* 2016; doi: 10.4103/1008-682X.167724.
  - 30 Thomas A Jr. Foreword: varicocele and male infertility: current concepts and future perspectives. *Asian J Androl* 2016; doi: 10.4103/1008-682X.172642.