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OPINION ARTICLE

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Compliance with recommendations for reliable semen analysis results – a matter of importance for patients and scientific development

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The usefulness of semen analysis results because of variability and lack of clear limits have been discussed for generations, not the least the matter of defining the difference between normal fertility potential and subfertility with references dating back to the first half of the 20th century (Harvey & Jackson, 1945). Current best praxis for laboratory andrology, to name only a few pioneers, has its roots in the fundamental studies by John MacLeod (MacLeod, 1950, 1951; MacLeod & Gold, 1951a,b,c, 1952, 1953a, b, 1957; Gold & Macleod, 1956) and the methodological work by Rune Eliasson (Eliasson, 1975) further developed by David Mortimer (Mortimer, 1994a,b). To enhance global improvement of quality in semen analysis, recommendations have been published by the WHO (Belsey *et al.*, 1980; World Health Organization, 1987, 1992, 1999, 2010). Unfortunately, the compliance with these recommendations have been in general mediocre (Jequier & Ukombe, 1983; De Jonge & Barratt, 1999; Riddell *et al.*, 2005).

In this issue of Andrology, a meritorious review of factors of major importance for the uncertainty and thereby the clinical value of semen analysis is presented (Tomlinson, 2016). Systematically, following the international standard for medical laboratories ISO 15189:2012 (International Standards Organization, 2012), the author pinpoints a long list of aspects any laboratory interested in producing a trustworthy service must consider and control.

In addition to this outline of the medical laboratory standard, it is important to consider that semen analysis is not only of clinical interest to predict the fertility potential of a man and thereby forecast the probability of fertility success in vivo and in vitro. Because of the great success of various assisted reproductive techniques (ART), it is often forgotten that semen analysis also has an important role in clinical andrology, to establish the functional state of the male reproductive organs and to monitor treatment effects of, for instance, hormone supplementation.

A crucial aspects brought up by the survey is the matter of compliance. It is an unfortunate and well-known fact that too many centers claim to comply with WHO recommendations without really doing anything else but using reference limits suggested by the WHO. Scrutinizing published studies utilizing results of semen analysis, it is an all too common finding that laboratory techniques are far from satisfactory even though the authors refer to WHO as source of the techniques used. To set this right, a checklist was recently published to aid authors, reviewers, and editors (Björndahl *et al.*, 2016). With a checklist pinpointing the crucial aspects of methodology for semen analysis, scientist planning studies will have better opportunities to choose techniques and procedures that better comply with the existing guidelines and thereby reduce the problems outlined in this issue of Andrology. Furthermore, if major scientific journals require the use of a consistent checklist to publish data on semen analysis, compliance with essential recommendations is likely to increase. For those who are worried that the use of a checklist might hamper new developments, it should be emphasized that the suggested checklist (Björndahl *et al.*, 2016) takes that into account, encouraging authors of non-compliant studies to provide scientific motivations for significant deviations.

A further extent of the presented overview points to a gap in the formal standards: the focus of ISO 15189:2012 is the general demands for structure and documentation of medical laboratories, and does not require compliance with, for instance, WHO (World Health Organization, 2010) and ESHRE (Barratt *et al.*, 2011) recommendations. From one point of view, this is logical, as these recommendations are only guidelines lacking the precise definitions required of a formal standard. However, the consequence is that accreditation bodies can only certify that a laboratory works in compliance with its own methods. With a formal ISO standard for basic semen analysis, any accreditation body can compare any laboratory in relation to the standard. A formal standard would make it easier even for smaller laboratories to become accredited – in the same way as companies sell culture media that have been tested, and thereby relieve the single laboratory from all compulsory control of the manufacturing process. In a similar way, compliance with a formal standard relieves the single laboratory from the burden of proving that 'self-made' techniques are reliable. And this also means that any laboratory not wanting to adhere to the standard will still be free

to define and prove the usefulness of its own techniques and procedures. But for global comparability and for the necessary development of basic and clinical andrology science, a formal standard is indispensable. Thus, it is evident that, if the andrology world strives for improvement of semen analysis as a basis for the development of andrology science, it should support the development of an andrology laboratory standard, based on existing best praxis as suggested by, for instance, the WHO and the Special Interest Group in Andrology of ESHRE. As a matter of fact, the first steps are now taken in this direction with the European Committee for Standardization (CEN), although it is still too early to say when it may become a worldwide reality.

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