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Letters to the Editor

Assessment of sperm morphology without quality control may be meaningless for clinicians

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Dear Editor,

Recently we read several articles related to sperm morphology [1–3] published on the Special Issue of *Asian Journal of Andrology* on Semen Analysis in 21st Century Medicine and were quite enlightened; herein we would like to present some of our views and suggestions.

Assessment of sperm morphology, motility and concentration provides a basis for decision on patient care. A number of studies have shown a statistical association between morphologically normal spermatozoa and fertility [4, 5]. Data from assisted reproductive technology programs also suggest that, if the percentage of sperm with normal morphology falls below 15% assessed with methods and definitions described in the Manual, the fertilization rate *in vitro* decreases [6].

Assessment of sperm morphology is much more difficult compared with assessment of sperm motility and concentration. Although quality control (QC) for sperm morphology is suggested to be essential according to the revised QC chapter in the WHO manual 5th edition [7], it is not well used for clinic in China and few people paid attention to its potential in evaluating male fertility. It is even worse that results from different laboratories vary significantly due to the poor implementation of QC for sperm morphology. The lower reference limit of 4% for sperm morphology proposed in the new edition of the WHO manual [7] makes QC even more difficult [2]. We are convinced that the assessment of sperm morphology without QC may be meaningless for clinicians. We would like to share some of our views on how to improve morphology assessment based on experience of our lab.

To begin with, four issues could be key to sperm morphology assessment. (1) Preparation of smears: the quality of smears will impact the result of staining. The smears must not be taken too thick. Otherwise, the debris and a large amount of particulate material will make it difficult to analyze. (2) Staining: how to make spermatozoa and other cells well-stained with a definite border depends on the choice of staining methods and frequency in changing the staining solutions. A prepared undyed smear for QC should be added in each dyeing batch to evaluate the dyeing effect. (3) Morphological evaluation: it is essential to establish a uniform and consistent definition of morphology. To minimize the variability of technicians, quality-controlled slides for sperm morphology should be used. Data from QC should be reviewed regularly by laboratory supervisors. If results were found to fall outside control limits, the problems should be addressed in time. (4) QC training: QC training for standardization of sperm morphology criteria could reduce individual interpreting difference. In our laboratory, the mean percentage difference reported among three technicians from our own laboratory was 4.57% ± 3.69% at the beginning, but after training, it decreased to 1.96% ± 1.19%.

Secondly, sperm morphology is usually assessed only in one sample in many fertility centers in China. We suggest that two samples should be collected to

assess sperm morphology just like the assessment of sperm concentration and motility.

Finally, it is more meaningful to assess the morphology of forward progressive sperms than other ones since the forward progressive sperms are able to fertilize ova. The percentage of morphologically normal spermatozoa was obviously improved after sperm selection using Percoll gradient centrifugation and swimming up technique [8, 9]. We assume that the total number of forward progressive and morphologically normal sperm per ejaculate is a more valuable indicator for male fertility potential, but it needs more data.

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