

## Stress, Health and Well-being of Clinical Embryologists



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### ABSTRACT

Clinical embryology is a demanding profession where the clinical embryologist is not only involved in the laboratory work with gametes and embryos but often a lot of logistic support. The pressures of timing, heavy workload, the monotony of procedures and the uncertainty of outcomes often creates a lot of pressures and stress on the embryologist. A stressed person is more likely to make errors, some can be insignificant while some can be disastrous like a mix-up or an accident. To add-on, long hours on the microscope can lead to soreness of muscles and joints leading to neck, back and shoulder pain. Physical pain with mental stress leads to discomfort and an unhealthy work environment. There are many publications on the burn out of health care professionals but not much is discussed about the health of an embryologist, a relatively new disciple. This paper discussed the various cause of stress in the life of an embryologist and also provides suggestions to overcome the same.

**KEYWORDS:** Stress, health, well-being embryologist.

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### MANUSCRIPT

#### Introduction

This massive growth of Assisted Reproductive Technology [ART] industry has led to a huge demand of ART professionals - mainly gynecologists - infertility specialists as well as clinical embryologists, the two pillars of ART. The clinical embryologists play a critical role in ART. They are involved in the processing of gametes, facilitating fertilization by insemination of oocytes or intracytoplasmic sperm injection (ICSI), culturing of embryos in vitro, cryopreservation of gametes and embryos, maintenance of the laboratory and culture conditions to facilitate development of healthy embryos, performing quality assurance

assessment of the laboratory and interacting with patients. All this work is highly skilled and requires crucial decision making abilities. Furthermore, some of them also perform additional techniques like embryo biopsy for pre-implantation genetic testing (PGT) which need more refined training and skills. In some clinics, the embryologists are also involved in the administrative duties, data management and ensuring the timely supplies of disposables, perishable culture media and related products. All these responsibilities make clinical embryology a very demanding profession.

It is estimated that there are 1200 embryologist working in 4000+ IVF clinics in India alone [unpublished

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data] which leads to many clinical embryologists working at multiple locations in the same town or city or even other cities, across states, creating strains of travel. The situation possibly is not very different in other parts of the world as the need for clinical embryologists is on the rise.

There is a rise in the training and educational programs in clinical embryology worldwide. In the past one year, there are many publications which delve into the topic of training and educational programs on clinical embryology. However, the demands on the profession are currently very high<sup>(1,2)</sup>.

To add on, ART cannot be considered to be a very effective procedure - as the desired outcome of healthy live birth - does not always occur in the first treatment cycle. The causes for the failure are innumerable ranging from age, cause of infertility, culture conditions, skills of the professionals involved and the still unknown reasons. However, in many clinics, the "needle of suspicion" points to the laboratory as not all Clinics have a healthy case discussion to determine the potential causes of failure. During personal discussions, embryologists have stated that despite meeting the laboratory Key Performance in the laboratory, the embryologists are questioned if all went well in the laboratory! This is another additional stressor for the embryologist.

Thus, all these conditions can create physical as well as emotional stress on the embryologist and could affect their work.

A few years ago, there was a report about the mix-up of embryos wherein one couples embryos were transferred to another patient where they implanted and resulted in a live birth<sup>(3)</sup>. There have been such reports in the past too and there may be some unreported on unnoticed incidents. The general public seemed scandalized how such an error could happen. As much as the 'mistake' seems unpardonable, we, working in do know that such a human error is not essentially due to callousness on the part of the embryologist but could be an outcome of work stress or fatigue.

### **Causes of such work-stress**

#### *Increased workload*

As the demand for ART services increases, there is a shortage of skilled and knowledgeable clinical embryologists which would lead to increased workload for the existing embryologists. It has been reported that a high workload has 5.4 times greater odds for the incidence medication errors as compared to low workloads<sup>(4)</sup>. Although, no such data exists for clinical embryologists - it is possible that increased workload could be a potential cause for errors in ART.

To address this issue, professional bodies such as American Society of Reproductive Medicine have set up guidelines on the workload of embryologists<sup>(5)</sup>. However, it is not possible for all to follow these guidelines because of lack of available trained manpower. To address this need, many educational programs are being set up across the world<sup>(6)</sup>. In the last 2 years, 18 Universities in India have started a Masters clinical embryology programs in India to serve the demand for formally educated clinical embryologists. It still needs to be seen whether these programs would generate the trained, skilled manpower which were, till now, nurtured by mentoring programs<sup>(2)</sup>.

#### *Timing*

Performing ART procedures at the right time is crucial for its success - be it follicular aspiration, denudation, insemination, ICSI, vitrification etc. Not performing procedures at the optimal time may affect outcomes. If there is a heavy workload, good time management and planning of the workload is essential to avoid situations of stress and panic, which can increase risk of errors.

#### *Low Lighting*

Although there is no data supporting the need for using low light in the ART laboratories, many laboratories still continue to use low light under the logic that in vivo the embryo grows in the dark working under diminished lighting<sup>(7)</sup>. Although scientific studies have provided low level evidence that low lighting affects work performance; there are reports that working in low light environment or lack of daylight exposure does affect the quality of life of workers<sup>(8,9)</sup>.

The embryologist is compelled to spend hours at length in poorly lit environments which is turn may cause eye strain and fatigue and affect their quality of life. There are also concerns being raised on whether clinical embryologists would be deficient in Vitamin D if they have poor exposure to light. Funaki et al (2022 reported that 90% of the health care workers studied in a clinic in Tokyo were deficient in Vitamin D and attributed that to the long hours of indoor activity during medical care and daily life<sup>(10)</sup>.

#### *Repetitive tasks*

Clinical embryology involves a lot of repetitive tasks, be it preparing dishes, changing the embryos into different wells during culture or vitrification-warming or ICSI. Manual repetitive tasks are known to be a source of human error in the laboratory<sup>(11)</sup>.

#### *Postural stress*

A clinical embryologist spends hours stooped over a microscope. Despite good ergonomics, an

embryologist does experience strain on the back, neck and arms. A nationwide survey on the health of the embryologist carried out in Spain revealed that 44% of the embryologists experienced headaches sometime or often; 70% experienced neck pain - of which 15% experienced it all the time while 55% had it often or sometimes. 76% experienced back pain of which 18.6% had it all the time. 95% experienced arm pain of which 29% had it almost always and nearly 65% experienced it sometime or often<sup>(12)</sup>. The prevalence of musculoskeletal problems is high compared with that for working populations but similar to that observed for pathologists or microscopists (ranging from 76 to 57 %) <sup>(13, 14)</sup>.

The study also reported lower mental health scores were obtained for women embryologists, embryologists who suffered headaches or pain in the neck or back, who suffered loss of visual acuity or who presented higher levels of emotional exhaustion or cynicism or lower levels of professional efficacy.

In a survey carried out on the occupational health issues experienced by UK embryologists, work-related ill health was self-reported by 58.3% of respondents, 76.2% of whom reported multiple issues. The most frequently disclosed ill-health conditions were musculoskeletal disorders (45.3%) and stress and mental health problems (27.8%)<sup>(15)</sup>.

Although, there are no such reports from other parts of the world, there is no reason to believe why embryologists health would be very different in other countries.

Postural stress may not necessarily result in the loss of man-hours at work but can surely affect the quality of work and the laboratory workspace. A person in pain cannot be expected to be happy. This would in turn be reflected in their behavior with their colleagues and may even bring about an unhealthy emotional environment at home.

### **Preventing occupational health issues of clinical embryologists**

1. Increasing the number of staff so that duties can be distributed.
2. Bringing about a rotation in the work being carried out so that the monotony can be broken.
3. Ensure weekly holidays. Sometimes, embryologists need to come to just pre-incubate media even on holidays. If the work can be planned such that the embryologist can get a total off.
4. Documentation and paper-work is a crucial and integral part of an embryologists' work. However,

if automated systems can be developed then this pressure can also be reduced on embryologists.

5. Embryologists can be asked to take a few minutes off after procedures to get some fresh air if possible or at least perform some simple exercises to release the back. The ancient Indian science of yoga does offer simple yogic postures which can even be done at the workplace to overcome the musculo-skeletal problems such as neck and low back pain. Modern studies have also provided evidence on its efficacy. Williams et al (2005) Pain 115: 107-117; Journal of pain 30:2012
6. Embryologists need to have some hobbies or sport; be it music, art, yoga, hiking - something that can help refresh their body and mind.
7. A healthy work environment is necessary. It is advisable to have managers or senior management who are from the field of ART so that they can relate to the work and thereby set realistic expectations.

### **Burnout**

Burnout is a reality among medical professionals. Burnout by definition is a reaction to prolonged stress that may include emotional exhaustion, cynicism, and a lack of satisfaction from work. Medscape carried out a survey in 2022 among 13000 physicians across various specialties on physician burnout and depression. They reported a burnout rate of 40 to 50% across the physicians surveyed and this was irrespective of the pandemic. One of the 5 physicians even considered leaving the profession<sup>(16)</sup>. Although burnout has not been reported or studied in clinical embryologists - it does not mean that it does not exist.

### **Conclusions**

A healthy embryologist therefore is not just the one who does not miss a days work because of ill health but one who is physically fit, emotionally balanced mentally sharp and alert with clarity in thought to take the right decisions.

It is time to reflect and act on the health and well-being of embryologists as they are not only responsible for the current but also future generations too.

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The author declares no conflict of interest.

## REFERENCES

- [1]. Racowsky C. Training and recognition of clinical embryologists as professionals-now, but what does the future hold? *F S Rep.* 2023 Jun 15;4(3):254-255.
- [2]. Scarica C, Woodward BJ, De Santis L, Kovačič B. Training and competency assessment of Clinical Embryologists and licensing of the profession in European countries. *Hum Reprod Open.* 2023 Feb 11;2023(1).
- [3]. Zhang S. IVF Mix-Ups Have Broken the Definition of Parenthood. *The Atlantic.* July 2019
- [4]. Ratanto R, Hariyati TS, Mediawati AS, Eryando T. Workload as the most Important Influencing Factor of Medication Errors. *Nurses Open nursing J.* 2021 15:204-210.
- [5]. Practice Committee of American Society for Reproductive Medicine; Practice Committee of Society for Assisted Reproductive Technology Revised guidelines for human embryology and andrology laboratories. *Fertil Steril.* 2008;90:S45–59. doi: 10.1016/j.fertnstert.2008.08.099
- [6]. Shapiro H, Brown TJ, Chronis-Brown P, Hamilton GS, Bentley DC, Kandel R, Gotlieb AI. Education of the clinical embryology laboratory professional: development of a novel program delivered in a laboratory medicine department. *F&S Reports* 2023; 4(3), 262-269.
- [7]. Pisaturo V, Alteri A, Tilleman K, Mortimer D Shedding light on the IVF laboratory: A cross sectional survey among embryologists, *RBM Online* 2022; PP-75, Vol 15 Suppl 1., E 46
- [8]. Pachito DV, Eckeli AL, Desouky AS, Corbett MA, Partonen T, Rajaratnam SM, Riera R. Workplace lighting for improving alertness and mood in daytime workers. *Cochrane Database Syst Rev.* 2018 Mar 2;3(3):CD012243. doi: 10.1002/14651858.
- [9]. Boubekri M, Cheung IN, Reid KJ, Wang CH, Zee PC. Impact of windows and daylight exposure on overall health and sleep quality of office workers: a case-control pilot study. *J Clin Sleep Med.* 2014 Jun 15;10(6):603-11. doi: 10.5664/jcsm.3780. PMID: 24932139; PMCID: PMC4031400.
- [10]. Funaki T, Sanpei M, Morisaki N, Mizoue T, Yamaguchi K. Serious vitamin D deficiency in healthcare workers during the COVID-19 pandemic. *BMJ Nutr Prev Health.* 2022 Jan 4;5(1):134-136. doi: 10.1136/bmjnp-2021-000364.
- [11]. Niepel M, Hafner M, Mills CE, Subramanian K, Williams EH, Chung M, Gaudio B, Barrette AM, Stern AD, Hu B, Korkola JE; LINCS Consortium; Gray JW, Birtwistle MR, Heiser LM, Sorger PK. A Multi-center Study on the Reproducibility of Drug-Response Assays in Mammalian Cell Lines. *Cell Syst.* 2019 Jul 24;9(1):35-48.e5. doi:10.1016/j.cels.2019.06.005
- [12]. López-Lería B, Jimena P, Clavero A, Gonzalvo MC, Carrillo S, Serrano M, López-Regalado ML, Olvera C, Martínez L, Castilla JA. Embryologists' health: a nationwide online questionnaire. *J Assist Reprod Genet.* 2014 Dec;31(12):1587-97. doi: 10.1007/s10815-014-0352-7.
- [13]. Fritzsche FR, Ramach C, Soldini D, Caduff R, Tinguely M, Cassoly E, Moch H, Stewart A. Occupational health risks of pathologists--results from a nationwide online questionnaire in Switzerland. *BMC Public Health.* 2012 Dec 6;12:1054.
- [14]. Thompson SK, Mason E, Dukes S. Ergonomics and cytotechnologists: reported musculoskeletal discomfort. *Diagn Cytopathol.* 2003 Dec;29(6):364-7.
- [15]. Priddle H, Pickup S, Hayes C; Association of Reproductive and Clinical Scientists (ARCS). Occupational health issues experienced by UK embryologists: informing improvements in clinical reproductive science practice. *Hum Fertil (Camb).* 2022 Oct;25(4):608-617.
- [16]. Kane L. Physician Burnout & Depression Report 2022: Stress, Anxiety, and Anger. <https://www.medscape.com/slideshow/2022-lifestyle-burnout-6014664>