A Redesign of the ProteX to Harvest Free Oxygen Species Appears to Improve Overall Semen Parameters

SAM PRIEN\(^1,2\), MELISSA SILIVENT\(^2\), LINDSAY PENROSE\(^1,2\)

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER; LUBBOCK, TEXAS 79430\(^1\) AND DEPARTMENT OF ANIMAL AND FOOD SCIENCES, TEXAS TECH UNIVERSITY; LUBBOCK, TEXAS 79409

Abstract

The ProteX system is a novel approach for harvesting sperm using a meniscus and a water interface to maintain sperm viability during and after collection. However, the system has not been optimized to maximize sperm motility and viability. In this study, we hypothesized that a redesign of the ProteX system, including the use of a restructured interface and the addition of antioxidants, would improve sperm motility and viability. We found that the redesigned ProteX system significantly improved sperm motility and viability compared to the original system. These findings suggest that the ProteX system has the potential to improve sperm quality and may have clinical implications for fertility treatments.

Introduction

It is well documented that a certain level of free-oxygen radical generation is necessary for normal semen function. However, too high a level of free-oxygen radical concentration within the fluid environment (cervical mucus, semen, or any combination) can lead to biochemical damage, including disruption of membrane integrity, loss of enzyme functions, and DNA fragmentation. Current technology for adding free-oxygen radical scavengers directly to the media does not provide effective protection to the cells in the semen samples. Therefore, we developed a new design for the ProteX system to overcome these limitations and improve sperm quality.

Materials & Methods

In this study, we compared sperm motility and viability between the original ProteX system and a redesigned ProteX system. Samples were collected from human semen donors and evaluated using standard sperm analysis techniques. The redesigned ProteX system included modifications to the meniscus design and the addition of antioxidants to the media.

Results

The redesigned ProteX system significantly improved sperm motility and viability compared to the original system. Sperm motility in the redesigned ProteX system was higher than in the original system, and sperm viability was also improved. These findings suggest that the redesigned ProteX system has the potential to improve sperm quality and may have clinical implications for fertility treatments.

Discussion

The redesigned ProteX system presents a promising approach for improving sperm quality. Further studies are needed to confirm these findings and to explore the clinical implications of this design.

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Conflict of Interest

There are no conflicts of interest associated with this work.

References