A direct, reliable, simple method for assessing Adipocyte viability taken from the Red Head* fat harvesting device

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Abstract

A total of seven separate specimen samples were obtained from the Red Head fat harvesting device, to asses Adipocyte viability utilizing methods based on fat cell isolation after collagenase digestion and Trypan blue dye exclusion staining. This direct method uses light microscopy, micro quantification, manual counting from digital images by using the protocol No. PT-001 (appendix 1), the Trypan Blue Exclusion Test of Cell Viability from *Current Protocols in Immunology* A3. B.1-A3. B.3, November 2015 (appendix 2) and the protocol for performing a Trypan Blue Viability Test Technical Reference Guide (appendix 3). There was excellent agreement between the methods' in the three different protocols for assessing the adipocyte viability.

Introduction

Our interest in adipose tissue cell viability, has been primarily in assessing adipocyte viability (obtained from the Red Head Harvesting device), through commonly used method (Trypan Blue Exclusion)[1]. This method requires collagenase digestion of the adipose tissue sample, separating adipocytes by centrifugation, followed by the Trypan blue staining. It also requires manual, micro quantification. We have added digital images recording to aid in the process. This ability to view and record the digital images, although inexpensive and quick, results in eyestrain when large cell counts and large numbers of samples are processed. Further dilution of the samples along with the image recording becomes a necessary aid in the process with the added benefit of the permanent visual record. These can be analyzed at a later time without compromising the cell viability of the samples. Factors affecting cell integrity are discussed in detail in the conclusion[2].

Conclusion

Assessing Adipocyte viability taken from the Red Head fat harvesting device can be performed in a direct, reliable, simple method using the established Trypan Blue exclusion test. The major drawback is that it relies in cell membrane integrity[1].

There are several factors that can alter cell membrane integrity: harvesting fat using a conventional 3-mm / 4-mm inner diameter harvesting cannula[2] and a conventional liposuction machine. The negative pressure applied for harvesting (1/2 atmospheric pressure), along with the solutions used in harvesting the fat does not appear to affect cell survival.[3, 4]

Added to this list of possible factors that can alter cell member integrity is the need to perform enzyme digestion and centrifugation to be able to perform the assay by dissociation of the adipocytes from the other cellular components.[5]

The time elapsed between the harvesting and the processing is very important in adipocyte viability [6,7]. The average timing in this study ranges from 30 to 45 minutes, and this includes the digestion and centrifugation of the seven samples.

This study shows that the Red Head fat harvesting device, yields high adipocyte viability, in the **88.5 %** range

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