INTRODUCTION

The quest to identify detectable serum biomarkers of abnormal pregnancy or placental function has been an ongoing focus in an attempt to improve maternal and fetal care. Timely point-of-care diagnosis is particularly relevant in light of increased maternal morbidity and mortality in the United States. If we are to reverse these trends, we must do a better job of identifying sick mothers before they are critically ill.

Current medical communities have an urgent need to develop rapid point-of-care techniques that effectively provide diagnostic information in a short period of time and allow instant analyses and distribution of data among providers. However, the most commonly used diagnostic modalities in clinical settings either lack easy accessibility, or take considerable time to provide results. There has been a recent report regarding an application of Mira M-1 (Metrohm, CA, USA), a hand-held Raman spectrometer, for rapid diagnosis of placental hyposia. The report combined Principal component analyses with the specific Raman Spectral software in order to dissect the patterns, associated with the pregnancy progression.

Raman spectroscopy (RS) is the methodology which allows for an investigation of physiology at cellular and tissue levels using photon scattering. It is a non-destructive and non-invasive method. Each peak in a Raman spectrum is associated with a unique part of the molecule and can be used for identification and confirmation. Orbital Raster Scanning (ORS) is a novel Raman spectroscopy sampling technique that helps to drive more accurate measurements and comprehensive analysis. ORS increases the sensitivity of Raman measurements up to 10 fold by rastering a tightly focused laser beam over a larger area. ORS (fraster: A scanning pattern of parallel lines that form the display of an image projected on a cathode-ray tube of a television set or display screen) RS could be used as the specific metabolic fingerprint and therefore represents a unique diagnostic tool. (Figure 1. Monograph, Introduction of Raman spectroscopy, Metrohm, USA).

OBJECTIVES

In this study we aimed to identify the Raman Spectral pattern of normal pregnancy, as well as the one of pregnancy from obese women during 1st and 2nd trimester, using Mira M-1 device.