

Seminal Fluid Analysis Parameters and Their Clinical Relevance

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INTRODUCTION

Seminal Fluid Analysis (SFA) is a fundamental diagnostic tool used in andrology to assess male fertility potential and reproductive health. Through the evaluation of various parameters within semen, clinicians can gain valuable insights into the functionality of the male reproductive system. This article aims to provide a comprehensive overview of seminal fluid analysis parameters, their clinical relevance and implications in male fertility assessment and management.

DESCRIPTION

Introduction to seminal fluid analysis

Seminal fluid or semen, is a complex mixture of fluids and cells produced by the male reproductive system. It serves as a vehicle for spermatozoa, providing nutrients and protection during their journey through the female reproductive tract. Seminal fluid analysis involves the examination of semen samples to evaluate several key parameters, including sperm count, motility, morphology, volume, pH and biochemical markers.

Parameters of seminal fluid analysis

Sperm count: Sperm count refers to the concentration of spermatozoa in the ejaculate. It is expressed as millions of sperm cells per milliliter (million/ml). A normal sperm count typically ranges from 15 to 200 million/ml. Low sperm count (oligospermia) may indicate reduced fertility potential and can be associated with various factors such as hormonal imbalances, testicular disorders or lifestyle factors like smoking and excessive alcohol consumption.

Sperm motility: Sperm motility assesses the ability of sperm cells to move effectively through the female reproductive tract. Motility is classified into progressive (forward) motility and non-progressive (non-forward) motility. High sperm motility is crucial for successful fertilization, as it enables sperm to reach and penetrate the egg. Abnormalities in sperm motility (asthenospermia) can impair fertility and may be caused by factors such as infections, hormonal imbalances or genetic abnormalities.

Sperm morphology: Sperm morphology evaluates the size, shape and structural integrity of sperm cells. Normal sperm morphology is essential for sperm function and fertilization. Morphological abnormalities, such as head or tail defects, can impair sperm's ability to penetrate the egg and may indicate underlying genetic abnormalities or environmental factors.

Semen volume: Semen volume measures the total amount of fluid ejaculated during orgasm. Normal semen volume typically ranges from 1.5 to 5 milliliters (ml). A low semen volume (hypospermia) may suggest problems with seminal vesicles or ejaculatory ducts, while high volume (hyperspermia) could indicate dehydration or prostate disorders.

pH level: Seminal pH indicates the acidity or alkalinity of semen. The normal pH range is around 7.2 to 8.0. Deviations from this range may be indicative of infections, inflammation or obstructions in the male reproductive tract.

Biochemical markers: Seminal fluid contains various biochemical markers, including fructose, zinc, citric acid and enzymes like Prostate-Specific Antigen (PSA). These markers provide additional information about seminal fluid composition and function. For example, fructose is produced by the seminal vesicles and serves as an energy source for sperm, while PSA is produced by the prostate gland and can help detect prostate-related disorders or inflammation.

Clinical relevance and interpretation

Seminal fluid analysis plays a crucial role in male fertility assessment and management. Abnormalities in SFA parameters can provide valuable diagnostic clues and guide treatment decisions. For instance, a combination of low sperm count, poor motility and abnormal morphology may indicate severe male factor infertility, requiring assisted reproductive techniques such as *In vitro* Fertilization (IVF) or Intracytoplasmic Sperm Injection (ICSI).

Furthermore, SFA can help identify underlying causes of male infertility, such as hormonal imbalances, varicocele or infections. Treatment strategies aimed at addressing these underlying factors can improve fertility outcomes. Additionally, SFA parameters

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may be monitored longitudinally to assess the effectiveness of fertility treatments or lifestyle modifications.

CONCLUSION

seminal fluid analysis parameters are essential indicators of male reproductive health and fertility potential. By evaluating sperm count, motility, morphology, volume, pH and biochemical

markers, clinicians can diagnose male infertility, identify underlying causes and tailor appropriate treatment strategies to optimize fertility outcomes.

Through continued research and technological advancements, seminal fluid analysis remains a cornerstone in the field of andrology, facilitating comprehensive evaluation and management of male reproductive disorders.