Comparative Study to Evaluate the Diagnostic Values between Fine Needle Aspiration Cytology, DNA Image Analyser and Histopathology in Diagnosing Ovarian Tumors

THESIS
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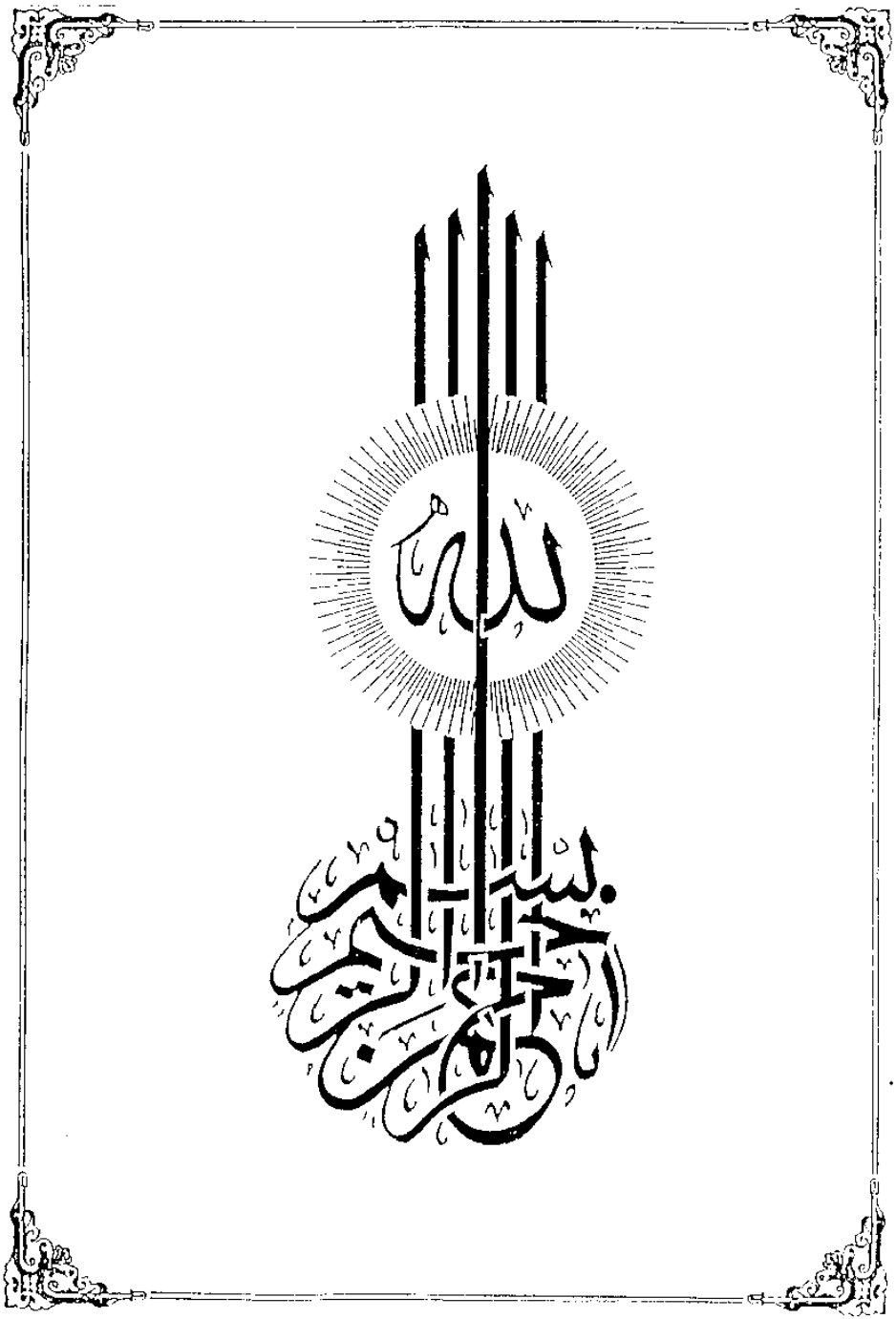

TABLE OF CONTENTS

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INTRODUCTION

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According to Young (1995), ovarian cancer is considered to be a commonly lethal malignancy. In 1995, about 26,600 women are expected to develop the disease in the United States, and about 14.500 women are expected to die, the use of appropriate adjuvant therapy together with early detection of the disease will steadily improve the outcome for ovarian cancer.

The prognosis for women with ovarian carcinoma is poor because of late diagnosis. Early symptoms are lacking and by the time, symptoms do appear in 60–70% of cases. The disease has already spread all over the peritoneal cavity (stage III). The 5–year survival rate is less than 20% in stages III and IV compared with almost 80% in patients with stage I disease (FIGO, 1979). To improve results, a method for early detection of the disease together with an effective chemotherapeutic drugs is necessary. Further, till today there are only a few ways of following the course of the disease and the effectiveness of the treatment (Wingo et al., 1995).

Exfoliative cytology of the female genital tract proved to be a well documented screening test that decreased the incidence of cervical cancer and early detection of endometrial cancer. Unfortunately, the anatomical site of the ovaries as a hidden organ and the incidence of ovarian malignancy impose a number of restrictions on the nature of a screening test for this disease. A direct sampling of ovarian tissue is not possible. (Jacobs and Oram, 1990)

Fine–needle aspiration cytology is a technique for diagnosis based on removal of a cell sample. The increased popularity of fine needle created a demand for applying this technique for diagnosing ovarian masses as it is a cheap, safe and can preserve ovarian function in young women, or to minimize surgical trauma in elderly high risk patients (Ramzy et al., 1979).

DNA ploidy have been reported as an independent prognostic variable in ovarian cancer patients, a diagnostic indicator of malignancy in suspicious cases and as a prospective indicator of malignancy. (Fouler et al., 1988 and Iverson, 1988).

AIM OF WORK

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1. Conflicting views and controversial results were reported concerning the accuracy of diagnosing ovarian lesions by fine–needle aspiration cytology. So, the first objective of this study is to evaluate the efficiency of fine–needle aspiration specimens.

2. The second objective of this study is to evaluate the possibility to differentiate by fine needle aspiration cytology between functional, benign or malignant tumors of the ovary.

3. The third objective of this study is to evaluate the accuracy of fine–needle aspiration technique in differentiating between different types of ovarian lesions.

4. The fourth objective of this study is to evaluate the adequacy of the cytologic specimen collected by fine–needle aspiration as a material for DNA image analysis.

5. The last objective of this study is to evaluate DNA ploidy as an independent prognostic variable in ovarian cancer patients, as well as a diagnostic indicator of malignancy especially in suspicious lesions, and as a prospective indicator in established malignant cases as compared with other parameters including clinical and histological grading.

REVIEW OF LITERATURE

ANATOMY AND DEVELOPMENT OF THE OVARY

The two ovaries are mainly solid ovoid structures, approximately measuring 3 × 2 × 1 cm. Each weighs 4–8 gm, the right ovary tending to be larger than the left. They are attached to the back of the broad ligament by the mesovarian, one on either side of the uterus by an ovarian ligament. The surface of the adult active ovary is corrugated, and is pale except where there happens to be some structure such corpus luteum. The part of the ovary attached to the mesovarian is the hilum and all nerves and vessels enter and leave at this point (Jeffcoate, 1981).

The early development of he ovary may be divided into four main phases. During the first phase, undifferentiated germ cells (perimordial germ cells) become segregated and migrate from their sites of origin to settle in the genital ridges, which are bilateral thickenings of the coelomic epithelium ventral to the developing mesonephrai. The second phase occurs after arrival of germ cells in the genital ridges, where proliferation of the epithelium and the underlying mesenchyma

occur. During the third phase, the gonads become divided into a peripheral cortex and central medulla. The fourth phase, in the female, is characterized by development of the cortex and involution of the medulla. The morphologic components of the ovary are histogenetically derived from four different but intimally related embryogenic elements (Fox and Langley, 1976).

The ovary gradually increases in size during infancy and childhood. Partial development and atresia of the follicles occur, and cystic follicles may be prominent in newborns as a result of placental gonadotropin stimulation. Ovulation and transformation of a follicle into a corpus luteum, however, await the onset of puberty and establishment of cyclical hypothalamus–pituitary–ovary hormonal feed–back system (Morrow and Hart, 1981).

In the ovary, the cortex survives and proliferates giving rise to an ingrowth to a peripheral ends of the medullary cords. The thin mesenchymal layer which originally separated the cortex and medulla disappear and thus cortical and medullary cords become continuous. The medullary cords extend into the mesovarium where they form a rudimentary rete network. Up