

Morphological Characteristic of Placenta in Sudanese

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Abstract

The placenta is the most important and the only organ between mother and fetus, serving multiple functions endocrinal, respiratory, metabolic and main useful functions. Normal development of a placenta is the one of the important requirements for a healthy pregnancy, regulating fetal growth and fetal health. The objectives of this study were to compare the placental weight with the infant's weight, to measure the placental diameter and to count the numbers of cotyledons in each placenta. The study was carried out among 240 infant, 102 females and 138 males, delivered at Omdurman new (Alsaudi) and Alshaikh Mohammed Ali Fadol hospitals of obstetrics gynecology. All infants were looked healthy and their weight ranged from 1.85 to 4.18 kg with mean of 3.02. The weight of placenta ranged between 0.35 to 0.77 kg with mean of 0.535 kg. Placental weight in males ranged between 0.35 to 0.75 kg with mean of 0.537 kg. While the female placental weight ranged between 0.4 to 0.77 kg with mean of 0.531 kg. The placental diameter ranged between 15 to 23 cm with mean 18.64 cm. The diameter in males ranged between 16 to 23 cm with mean 18.52 cm. In female was ranged from 15 to 23 cm with mean of 18.81 cm. The mean of cotyledons number was 19 with std. Deviation 1.362 and ranged from 16 to 22. The mean of number in males was 19.17 and ranged from 16 to 22 and in females the mean was 18.88 and ranged from 16 to 22. According to Pearson, Kendall's Tau b and Spearman's rho correlations and found that there is a significant relationship between infant weight and placental weight.

Keywords: Placenta; Ccotyledon; Placental weight; Placental diameter; Umbilical cord.

Introduction

Early in gestation, the developing embryo is small and its nutritional and waste disposal needs are minor. At this point, the embryo absorbs nutrients from the mother's endometrial secretions and expels its waste into the uterus. As time passes, the needs of the embryo increase. As it progresses from embryonic stage to fetal stage, more nutrients

are required and a much more sophisticated means of satisfying the nutritional and waste disposal needs must be established. This is accomplished only after the embryo develops a vascular system and can establish an effective and efficient interface (i.e., the placenta) between the mother's vascular system and its own. In addition to nourishing the fetus and providing a means for disposing of its wastes, the placenta secretes a number of hormones, including the steroid hormones estrogen and progesterone. It also secretes protein hormones and is the source of human chorionic gonadotrophin (hCG). A luteinizing hormone, hCG is secreted by the syncytiotrophoblast of the placenta in early pregnancy. It maintains the function of the corpus luteum and stimulates progesterone production in the placenta. Because hCG is found in the blood and urine of pregnant

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women, it is the basis for most common tests used to diagnose pregnancy.

The placenta secretes the hormone relaxin, as well, which is thought to relax the joints of the pelvis and assist in dilating the cervix during birth.[1]

The placenta is the most important and the only organ between mother and fetus, serving multiple functions. It acts as an endocrine organ producing several types of hormones e.g. lactogen, chorionic gonadotrophins etc. It allows the exchange of oxygen and CO₂, whereby transfer of oxygen takes place from maternal blood to the fetus, and carbon dioxide goes out from fetus to mother. It allows the transfer of carbohydrates, protein, amino acid, polypeptides, lipids, vitamins, water, electrolytes and pharmacological agents from the mother to the fetus.

A placenta has a maternal surface (basal plate) and a fetal surface (chorionic plate). The basal plate and chorionic plate meets at the placental margin and form the smooth fetal membranes. The space between chorionic and basal plate is filled with the intervillous lakes of maternal blood. The placenta develops from the same sperm and egg cells that form the fetus, and functions as a fetomaternal organ with two components, the fetal part (Chorion frondosum), and the maternal part (Decidua basalis).[2]

Besides secreting hormones, the placenta protects the fetus from immune attack by the mother and induces increased maternal blood flow to the placenta. Near the time of delivery, the placenta produces hormones that mature the fetal organs in preparation for life outside of the uterus. The placenta supports essential fetal respiratory functions before lung development, carrying oxygen and nutrients from the maternal blood across the membrane into the fetal circulation by diffusion and allowing carbon dioxide to pass in the opposite direction. The placenta provides the fetus with water, inorganic salts, carbohydrates, fats, proteins and vitamins and carries fetal waste into the mother's circulatory system to be secreted via her urinary system. The placenta

also protects the fetus by prohibiting some harmful microorganisms from entering fetal circulation. A portion of the placental membrane called the placental barrier provides this protection. Storage is another function of the placenta. The placenta stores carbohydrates, calcium, iron and proteins for release into fetal circulation. Two portions make up the placenta: fetal and maternal. The fetal circulation enters the placenta via the two umbilical arteries that are embedded within the umbilical cord. Once the fetal arteries enter the placenta, they branch into units called cotyledons, which are structures similar to inverted trees. The tiniest branches of the fetal circulation are made up of capillary loops embedded within the chorionic villi. The fetal circulation continues to branch until it reaches capillaries of the villi. Once nutrients have been absorbed and waste products released, the fetal blood collects in the umbilical vein, where it returns to the fetus. The maternal portion of the placenta receives blood by way of the spiral arteries of the uterus. When the spiral arteries make contact with the placenta, they end in open channels that pour maternal blood into the intervillous space. The intervillous blood is returned to the maternal circulation through drain-like uterine veins. As much as 35% of the maternal blood will course through the intervillous space to support the fetus until the time of delivery.[2]

The fetal and maternal portions of the placenta connect via the umbilical cord. This sustaining connection between the fetus and the placenta is formed rudimentarily by the fifth week of gestation.

The fetal heart pumps fetal blood through the umbilical arteries into the placenta, where tiny branches are bathed in maternal blood. These vessels are drained by the tributaries of the umbilical vein, which take the blood back into the cord to the fetus for return to the heart. As a result, used blood is pumped through arteries to the mother and refreshed blood is returned to the fetal circulation by veins. After birth, this job is performed by the lungs. Shortly after birth the cord is clamped and cut and the remnant shrivels and separates from the