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BIO INDICATORS FOR EXPOSING TO CONGENITAL MALFORMATIONS AND FACTORS CORRELATED WITH THEM IN GOATS : A REVIEW

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Abstract

Congenital defects that inherited from parents to progeny are considered concerned issue in the field of animal breeding especially goats, which disposing to several causes that effect on their viability , performance , and productivity resulting incomplete births and abortion so , this review conducted to view most of animals defects and methods that followed for diagnosing these defects to reduce cost of breeding in early embryonic period in addition , means of breeding such as using selection for induction equilibrium of good and important genes by crossing these animals with beef males to have animals with high weights despite of unlethal defects available, many of biological markers used to investigate presence of malformations in embryonic early stage, alfa feto protein and amniocentesis are some of these ways for shortening gestation period and abortion the embryos with lethal defects. Furthermore, Immune protein IGM test in maternal serum, if this protein is found this mean the embryo disposing to an infection with a kind of microorganisms and this may be lead to a defect, another test is a total protein in maternal serum, which enabled to predict anomalies.

Key words : Congenital, defects, methods, goat.

Introduction

Embryo and fetal development is a result of series complex steps, may be happened an error sometimes produce viable or non-viable neonates with genetic defects and that due to genetic causes as chromosome abnormality also mutations, which translated from one or both parents to offsprings and contribute in organogenesis that maybe affected by microorganisms, poisons exposing in the late differential stage of embryo which result cerebellum palate infections in critical stages of embryos development (Dana *et al*., 2015). Congenital anomalies inherited through mutant genes in animal line breeding or autosomal recessive genes like arthrogryposis in cattle, some defects appeared from interaction of more than one gene such as hypotrichos which controlled by two loci for gene. However, polledness in dairy goat correlated with recessive alleles in female produced masculinization thus, 23% of those goats with homozygous called polled intersex goat associated with hornless character (Roukbi, 2013). Udder problems known as a genetic diseases furthermore. Mutant genes responsible on these traits which cannot declare themselves until conducted inbreeding method, on the other side, 60–60.5% of congenital disorders due to monogenic (Basrur and Yadav, 1999). Keuhn and Olson (2017) indicated that 6–7% of cattle have shortening phenotype and reduction of body weight also complex vertebral malformation that occurred with percentage 31% therefore, management of these animals have lower cost than those breed after period of their life when defects appeared although their high productivity, in addition, most defects which related to recessive autosomal genes, this means that both parents carrier of homogenes or heterogenes and that perform to defect with rate 100% and 25%, respectively.

Environmental factors like food deficiency, infections, Viruses, drugs, parasites, poisoning plants, chemical materials which interacted with genes and alleles (Raoof *et al*., 2017) to cause abnormal development in growth or tissue conformation for embryo in the first growth stages also genetic differences influence on hormones production, many receptors and building proteins in addition ions pathways in the body (Wagner *et al*., 2014)

which resulted building or functional damages effect on structure or function partly of various systems in the body, at the same hand, physiological or physical defects maybe translated throughout generations which result synthetical or functional congenital defects lead to phenotypic variance in the same mutantgene cause health problems so that, amniocentesis conducted as a prenatal diagnostic sample taken by a needle inserted via amniotic cavity to sampled amniotic fluid which contains fetal cells of skin , lungs, or urinary tract to identify chromosomal abnormalities. Chorionic villus way in several of foetus defects as mummified foetus, prolonged gravidity, the thickening of embryo leuma (Citek *et al*., 2009). Most of malformations could be recognized at birth (Khodakaran *et al*., 2014). Defects received to 3–48% among cattle in Brazil for periods from 2000–2008 (Dantas *et al*., 2010). Males more susceptible to mutations in germ cells so, their effect on neonate is more than females also defects rates varied among females and males in Iraqi goats (Abd-Almaseeh *et al*., 2012). However, from 3 – 4% of malformed newborns still alive, which resulted from triplet frequency of nitrogen basis abnormality for many times refer to formation anomalies protein synthetically and error in metabolism which cause metabolic diseases for periods 2011–2012 in Germany cattle (Wagner *et al*., 2014). Functional anomalies including various traits for immune system which causing immune deficiency because of non conformation of lymphocytes which perform to mortality (Green and Greeden, 2003). Congenital anomalies recorded 60% among cattle and goat in Denmark that refer to inbreeding which increasing of concentrated genes and weekend their functional ability and cause new mutation (Agerholm, 2011), plasma proteins found in both of maternal serum and amniotic fluid , these proteins have essential role in building of embryonic and maternal bodies as well as necessary for stay alive also have physiological effect on immunity and growth, which determined the phenotype so, they contributed functionally, enzymatically and synthetically inter cell, therefore all effects are result in biochemical interactions which need to enzymes and consist of proteins partially or entirely (Piccione *et al*., 2011). Furthermore, there are phenotypic effects belong to different amounts of non-enzyme proteins while predisposing to abnormal environmental and genetic factors influence on their functions and that reflected by protein change, which oxidative because of degradation of amino acids that lead to damages and losing the function, which influenced on inter cell and conformation factors play a role in infection and defects induction them stopped proteo mechanism, which destroy protein for that different proteins accumulated inside cell causing development of disease and defect while carbonyl groups produced on both sides of protein (Piliac, 2015). Proteins produced in liver as response for tissue damages (Ibrahem *et al*., 2008). Protein metabolism has an active role during gestation functionally and physiologically also in milk production period. Total protein test includes proteins and globulins which raised in many of disease and declined with malformations occasionally so that , this test used to predict most of malformations with rate 85% with sonar and 95% for 1GM globuline test (Diogenes *et al*., 2010). Alfafeto protein found with diploid and triploid shapes, correlated with copper, nickel and fatty acids and ranged from 51–67 DK normally in ruminant depending on carbohydrate 6–8%, this protein used to diagnosing many of congenital disorders for embryo and form by genetic code of alfafeto protein gene produce estrogen hormone to prevent change sex of female embryo, in the same side, it is found in embryonic membrane and its high level associated with nerval tube defect, ventral wall abnormals, systichygroma , gastroschisis, omphalbcole, alfafeto protein has fundamental role in development events like erythropoiesis, histogenesis, organogenesis and ligand binding (Beriot *et al*., 2014). This protein is glycoprotein contains of 591 amino acids produced from yolk sac or intestine gut and liver of embryo then translated throughout placenta to maternal blood. Its level different according to predict a defect in gut atresia in 6.25% of embryos. Moreover defect of spinal column, this protein stimulated by radio immune Assay (RIA) (Verdy, 2006). Abd-Almaseeh *et al*. (2012) recorded that Iraqi goat with weights 5–5.8 kg at birth have genital and lmperforaledanus, which are more popular in male, while Tibary (2015) membered that ovarian dygenesis or hypoplasia as well as cervical aplasia were more genetic defects widespread. In the same hand, Wagner *et al*. (2014) viewed that deformation of spinal column and asymmetry of skull watched among newborns with rate 32.4% and 24.3%, respectively and that due to virus infection during gestation, while it was 1.81% for sporadic and bone defects received to 0.60% in Brazilian goat (Dantas *et al*., 2010), many other cases caused abortion like brachyspina (short spine) and dysplasia, which found in Danish goat (Agerholm, 2011) also abnormality of bone size that associated with nerval tubes, arteries cardiasepta and limb abnormal in Iranian goat (Khodakaran *et al*., 2014). Santos *et al*. (2016) found that 50% of embryos have bone, ribs and head anomalies also multi teats in dairy cattle. Sponenberg (2016) reported that multi teats have no correlation with mammary gland function while this trait found in Dwarf dairy goat, which belong to

mothers have a high milk production in Nigeria (Goodwin, 2013). From previously, malformations appeared in goats causing economic loses and increasing costs so that to avoid these problems many methods conducted for this purpose.

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