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Review Article

A SHORT REVIEW ON STRUCTURAL DEFORMITY OF ORGAN- FROM GREEK ARAB TO CONTEMPORARY SCIENCE

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ABSTRACT

The Greek Arab system of medicine is one of the ancient medical systems. This system is serving the humanity in health care services from thousands of years. In early era, the Greek and Arab physicians described diseases, causes of diseases as well as symptoms etc in rational way. They have explicated the topic related to disease separately like causes of Sue Mizaj (disturbances in temperament), Sue Tarkib (structural deformity) and Tafarruq Ittisal (dissolution of continuity). It is the need of hour to propagate and generalize their knowledge for further research and make it easy to understand. This paper aims to provide the comprehensible literatures of causes of structural deformities before, during and after birth described by the Greek Arab physicians and its understanding in present era.

KEY WORDS: Structural defect; primary alterative power; formative power; genetic material.

INTRODUCTION

Fasad-e-Shakl (shape or structural deformity) includes abnormal development of organ or part of organ. This deformity will hamper the functions of organ whatever it performs or executes in normal condition. Ibn al Quf has written in his renowned book "Kitabul Umda Fil Jarahat" about structural deformity and developmental anomalies. He has written specially about reason of structural deformity. He has classified the causes into three main categories and further he has described in detail; for instance, some causes of deformity are related to embryonic development, some are at the time of birth and few causes are related with postnatal care and with adult life. In fact he has given an idea about birth defects as well as acquired structural deformity. [1]

STRUCTURAL DEFORMITY AT EMBRYONIC STAGE

There are two causes or powers which are responsible for normal foetal development one is Quwwat-e-Mughaiyera Ula (primary alterative power) and second is Quwwat-e-Musawwira (Formative power). These powers are inherent in the Madda Manwiya (male and female reproductive material or cell). If there is a disturbance in Quwwat-e-Mughaiyera Ula (primary alterative power), then this Quwwat (power) will be unable to do normal alteration in context of Mizaj (temperament) in combination of both Madda Manwiya (male and female reproductive material or cell). Due to improper alteration in fertilised substance, there is a defective structural formation of organ or its part. It means Quwwat-e-Mughaiyera Ula (primary alterative power) has not introduced the apt Mizaj (temperament) into Madda Manwiya (male and female reproductive material or cell) whatever the particular organ deserves. [1] In present era, this Greek explanation related to primary alterative power is known as chromosomal defects like Down syndrome, fragile ex syndrome etc. [2]

Another power is formative power which is responsible to provide proper structure and shape to the organ according to their Mizaj (temperament) whatever they are having or introduced by primary alterative power like hollowness, solidity, roundness and flattening of organ. [1] According to modern theory; epiblast is developed and changed into three basic germ layers in the embryo ectoderm, mesoderm and endoderm. These layers are going to form all tissues and organs which start from third week and end on eight week of foetal development.[3] In Greek system of medicine this epiblastic development is due to Quwwat-e-Musawwira (formative power) which is executing the inherent capacity of being converted into allotted organ. If this power is hampered or distorted then it will not give proper shape and structure to the organ during the embryonic life[1] e.g. in normal condition after some time neural tube must be closed but when neural tube closer fails to occur in the cranial region; brain fails to form is known as Anencephaly if failure of neural tube closer is in other than cervical region; defect is called as Spina bifida. [3] After formation of organ; here we must discuss some other power which is responsible for three dimensional growth of an organ which is known as Quwwat-e-Namiya (power of growth). Sometimes shape and structure of organ may be normal but due to disturbances of growing power it may lead to abnormal growth of organs[4] like congenital renal atrophy.[5] At present this above Greek description has been proved that growth may be affected by nutritional deficiency of different minerals or vitamins. Like magnesium, calcium, and phosphorus are essential for skeletal growth but if there is a deficiency of these minerals, skeletal growth may be altered.[6] It is found that, growth retardation may be due to severe deficiency of vitamin A [7] because Vitamins play significant roles in growth of cell.[8] If nutritive power is weak or unable to retain or absorb these minerals or vitamins; skeletal growth or growth of any particular organ will be affected.

GENETIC MATERIAL AND ITS DISTURBANCE

If the cause is related to the genetic material; it will be of two types one is change in Kammiyat (quantity) and another is related to Kaifiyat (quality) of genetic material. [1,9] This thought of Ibn Hubal and Ibnul Quff is corroborated by current science in which it is said that there are two types of abnormalities of chromosomes or genetic materials; one is numerical and other is structural genome abnormalities which are responsible for developmental deformities. These two types of genetic material anomalies are accounting for 10% of major birth deformity. Normally the human somatic cell contains 23 pairs of chromosomes (46 chromosomes). [3] In case of quantitative disturbance in the genetic material or genome; there will be two situations one is of increase and second is of decrease material. Due to more genetic material; the powers like primary alterative and formative power will not execute proper temperament and structure or shape in the material to develop the organs [1,9] for example due to imbalance of translocation between two chromosome may produce extra copy of any chromosome like in Down syndrome which is caused by extra copy of chromosome number 21 which is known as trisomy 21 with characteristics of flat face, small ear and epicanthal folds etc other example is Klinefelter syndrome the cell is having 47 chromosomes with presentation of gynecomastia, testicular atrophy and hyalinization in seminiferous tubules etc. Like that if genetic material will be less in quantity then organ will not reach to its normal structure for e.g. cleft palate or lip etc other than these deformities; chances of missing or undeveloped limbs are there; in case of Turner's syndrome in which the cell is having 45 chromosomes resulting in gonadal disgenesis.[3] The above explanations about genetic material and related problems have been discussed in Greek Arab system of medicine. Greek scholars said that primary alterative power and formative power will not be able to provide proper structure to the organ because proper quantity of genetic material is essential for the formation of required shape and structure of organ.

Ibn al Quf has written about the Kaifiyat (qualities) of Madda (genetic material) and its impact on structural formation of organ or its part. He described that if the genetic material is so much concentrated owing to the presence of Buroodat (coldness) or Yubusat (dryness) in genetic material or coming from uterine cavity;[1,10] the organ will not acquire desired structure because the concentrated genetic material is unable to stretch in correct way to reach their normal shape. This above discussion about quality of genetic material has been supported by present scientists and scholars in view of mitotic division. After union of male and female gametes in the uterus; mitotic division takes place there. During this division some important phases are there one of them is prophase; in this phase the chromosomes begin to twist, contract and compact. Throughout this phase; the genetic material continue to shorten, condense and thicker. But during metaphase the chromosomes start to separate and line up in the equatorial plane of cell.[3] Here during metaphase, separation and line up of chromosomes are very important for cell mitosis; if this phase is disturbed and there is a no uncoiling and line up of chromosomes the mitotic cell division will not occur in proper way. This above phases and related changes are supporting the Greek scholars thought about condensation and coiling of genetic material which is due to coldness and dryness of uterus and genetic materials. If there is abnormal or excessive coldness and dryness in the uterus and genetic material; the chances of birth defect will be more because this excessive coldness and dryness will hamper the uncoiling and line up of genetic material.

If there is dominance of wetness or fluidity in material causes instability in genetic material or short time stay in uterine cavity, eventually formative power will not work properly on that material thus leading to inappropriate structural formation of organ.

Second type of cause for structural deformity occurs at the time of foetal birth. Ibn al Quf said that this type of deformity is due to abnormal position or presentation of foetus. He explained about normal presentation of baby at birth as; firstly head of foetus must come out with stretching of both hands on both thighs, other than this position is abnormal position. One abnormal position is breech presentation; when podalic extremities of foetus lies on the pelvic brim and head is residing in the fundus of the uterus then it is called as breech presentation.[1,10-16] Other deformities during delivery process are birth traumas like fracture of clavicle and femur, hip joint dislocation and atlanto-occipito joint as well as facial nerve palsy. [11]

Other causes of shape deformity after delivery of foetus are as following-

(i) Baby not lapped properly by mother or any other person. (ii) Improper wrapping of baby (taqmeet) (iii) Any mechanical or pressure injury. (iv) Baby is compelled to stand or walk before its recommended age. (v) Excessive milk feeding which may lead to increase quantity of Barid Ratab (cold wet) substance in the body resulting in deforming the organs. (vi) Iatrogenic (vii) One cause is related to baby itself that baby moves the organs before reaching the normal strength. (viii) Sometimes, other acquired diseases may cause structural deformity like Juzam (leprosy), Falij (paralysis), ulcers, spasm, contractures [9,10-16] diabetic neuropathy and retinopathy, etc.[2] Other than these defects, Greek Arab scholars have described some other deformities of simple and compound organs and their causes which may be responsible for temporary or permanent defect.

SHAPE AND STRUCTURAL DEFECTS AFTER BIRTH

There are four types of deformities related with shape, ducts, cavities and surfaces.
Change in shape may affect normal contour of any organ e.g. straightening of curve organ. [9,10-16]

Ducts and Channels

1) Dilation of duct e.g. intra hepatic and extra hepatic bile duct dilatation. It is caused by diseases or acquired conditions. [17]
2) Narrowing of duct, e.g. trachea bronchial stenosis due to extrinsic compression or caused by a tumour etc. [18]
3) Occlusion of the biliary tree, which can be due to stones, tumours etc. [19]

Cavities and Sacs

1) Increase in size, e.g. scrotal dilation in hydrocele.
2) Decrease in size, e.g. contraction of the ventricles of brain in epilepsy.
3) Occlusion in the cavity, e.g. obstruction in the ventricles of brain as in coma.
4) Emptiness of cavity, e.g. in the cavities of heart due to excessive pleasure.

Surface Defects

1) Loss of normal roughness, e.g. atrophic mucosal membrane of stomach or intestines. [9,10,12-16]
2) Loss of normal smoothness, e.g. roughness of skin in hypothyroidism called as xerosis. [20]

Diseases of Size

1) Megalies, e.g. as in hydrocephalus[2], splenomegaly[21] etc due to abnormal nutritive power and accumulation of abnormal material.
2) Atrophies, e.g. cirrhosis of liver, brain atrophy[2] etc due to weak nutritive power of particular organ.

CONCLUSION

With short review of Greek Arab literatures about causes of structural deformities; it was found that in Greek Arab system of medicine, there is a proper explanation of causes of structural deformity. They have discussed the causes of before, during and after birth defects in rational way. In that time they were familiar about how foetal formation starts and which type of Quwwat (power) is responsible for its development. Other than before birth causes, they also described the causes or reasons of structural deformity at the time of delivery and after birth.

In this paper after review of Greek Arab as well as present knowledge about structural deformity; it may be concluded that present knowledge building or treasure has been created on the foundation laid by Greek Arab physicians and philosophers almost 1500 years ago.

REFERENCES

1. Quf IA. Kitab Al Umda Fil Jarahat. Vol-1. New Delhi: CCRUM; 1986.
2. Mohan H. Text book of Pathology. 7th ed. New Delhi: Jaypee Brothers Medical Publishers Ltd; 2015.
3. Sadler TW. Medical Embryology. 12th ed. Philadelphia: Lippincott Williams &Wilkins; 2012.
4. Anonymous. Al-Qaun Fil-Tibb. New Delhi: S Waris Nawab; 1993.
5. Kanimozhi1 S, Sathish R. Unilateral Atrophy Of Right Kidney-A Case Report. International Journal of Current Research in Medical Sciences 2017; 3: 86.
6. Golden MH. The Role of Individual Nutrient Deficiencies in Growth Retardation of Children as Exemplified by Zinc and Protein. New York . Vevey Raven Press Ltd. 1988; 14:158.
7. Rivera JA, Hotz C, Gonza T, Neufeld L, Guerra AG. The Effect of Micronutrient Deficiencies on Child Growth: A Review of Results from Community-Based Supplementation Trials. The Journal of Nutrition, 2003; 133: 4015.
8. McArdle HJ, Ashworth CJ. Micronutrients in fetal growth and development. British Medical Bulletin 1999; 55:500.
9. Baghdadi IH. Kitabul Mukhtarat Fit Tib. 1st ed. New Delhi: CCRUM; 2004.
10. Majoosi IA. Kamilus Sana'ah. New Delhi: CCRUM; 2010.
11. Sabaratnam A, Sivanesaratnam V, Chatterjee A, Kumar P. Essential of Obstetrics. 1st ed. New Delhi; Jaypee Brothers Medical Publishers Ltd: 2004.
12. Jurjani I. Zakhira Khawarazm Shahi. New Delhi: Idara Kitabus Shifa; 2010.
13. Ibn Sina IA. Al Qanoon Fit Tib. New Delhi: Idara Kitabus Shifa; 2010.
14. Shah MH. The General Principles of Avicenna's Canon of Medicine. New Delhi: Idara Kitabus Shifa; 2007.
15. Gruner OC. The Canon of Medicine of Avicenna. New York: AMS Press; 1973.
16. Chandpuri K. Mojizil Qanoon. New Delhi: Qaumi Council Barai Farogh Urdu Zuban Publication; 1998.
17. Yunfu LV, Lau WY, Haiying W, Chang S, NingLiu, Li Y, Deng J. Etiological Causes of Intrahepatic and Extrahepatic Bile Duct Dilatation. International Journal of New Technology and Research 2015; 1:53.
18. Puchalski J, Musani AI. Tracheobronchial Stenosis Causes and Advances in Management. Clin Chest Med 2013; 34:558.
19. Baillie J. Advances in Endoscopy -Current Developments in Diagnostic and Therapeutic Endoscopy. Gastroenterology & Hepatology 2009; 5:695.
20. Halilovic EK. Thyroid Disease and the Skin. Annals Thyroid Res 2014; 1:28.
21. Kumar, Abbas, Fausto. Robbins and Cotran Pathologic Basis of Disease. 7th ed. Philadelphia: Saunders; 2004.

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