Available online at http://www.ijcrls.com

International Journal of Current Research in Life Sciences
Vol. 07, No. 04, pp.1729-1732, April, 2018

ISSN: 2319-9490

RESEARCH ARTICLE

ASSESSMENT OF CONGENITAL MALFORMATIONS ASSOCIATED WITH INCREASING MATERNAL AGE

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Received 18th February, 2018; Accepted 17th March, 2018; Published 30th April, 2018

ABSTRACT

Introduction: Birth defects usually occur during organogenesis (between 3rd and 8th week of gestation). They may result in complete or partial absence of an anatomical part or alteration of its normal configurations. Mostly, these are caused by environmental or genetic factors acting independently or in concert. Major structural anomalies occur in 2% to 3% of live born infants. An additional 2% to 3% are recognized in children by age 5 years, for a total of 4% to 6%.

Objectives: To determine various risk factors responsible for such malformations and evaluate if increasing maternal age is an independent risk factor for major congenital anomalies diagnosed at the time of second trimester anatomic survey, in the absence of aneuploidy.

Subjects and methods: The study design was a cross sectional, descriptive study conducted at Paeds wards of Services Hospital Lahore and Children Hospital Lahore. Infants admitted with congenital malformations were included in this research. Infants admitted with traumatic injuries or any other abnormalities which were not congenital in origin were excluded from the research.

Results: A total of 390 mothers of the patients were interviewed for the study. 46.9% babies were male, 51.1 were female and 3.0% babies with ambiguous sex in whom sex was not yet established. The most frequent anomaly was Hirsch sprung Disease which was found 10% in subjects.26.6% patients presented with cardiovascular defects 23.3% patients presented with gastrointestinal defects, 9.7% patients presented with musculoskeletal, and 20% patients presented with central nervous system defects. Only 3.5% patients presented with respiratory system defects while 10.5% patients presented with and urogenital defects.

Conclusion: The conclusion of study is that the increasing mother's age is not associated with increased incidence of congenital malformations. The impact of a higher mother's age on other chromosomal anomalies was not found to be so strong.

Key words: Congenital, Infants, Age, Malformations.

Citation: Asma Jamil and Muhammad Yousaf, 2018. "Allama iqbal medical college (uhs) lahore pmdc # 85297-p " *International Journal of Current Research in Life Sciences*, 7, (04), 1729-1732.

INTRODUCTION

Birth defects are defined as "those conditions that are substantially determined before or during birth and which are, in principle, recognizable in early life." Some of these defects are classified as major and may require surgical intervention and/or cause death of the infant. Others are classified as minor, which are significantly detrimental to the quality of life and health of the patient. However, this classification is somewhat ambiguous, as some minor anomalies can be associated with underlying major defects. This association could be 3% in patients having one, 10% in patients having two, and 20% in patients having more than three anomalies.

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Birth defects usually occur during organogenesis (between 3rd and 8th week of gestation). They may result in complete or partial absence of an anatomical part or alteration of its normal configurations. Mostly, these are caused by environmental or genetic factors acting independently or in concert. Major structural anomalies occur in 2% to 3% of live born infants. An additional 2% to 3% are recognized in children by age 5 years, for a total of 4% to 6%. Worldwide, the incidence of congenital anomalies varies between geographical regions but it is estimated that 3-7% of children are born with birth defects (Tennant, 2010). The prevalence of birth defects varies widely, depending on the geographical locale. It was found to be 2.07% in Turkey, 2.39% in Europe, 1.5% in Japan and 1.96% in the United States. These numbers, just as in our case, are

based on studies conducted in limited settings, such as hospitals.

These do not take into account all those infants who are born at other centers. Their prevalence may be very different from those reported for tertiary care centers, as they are often visited by patients belonging to a wide range of socioeconomic statuses, which has been implicated as a possible risk factor for birth defects. The congenital malformations are also present in Pakistan and they show almost the same trend of incidence as in other countries i.e., the incidence congenital malformations is associated with increasing maternal age. About 3% of newborns have a "major physical anomaly", meaning a physical anomaly that has cosmetic or functional significance. Physical congenital abnormalities are the leading cause of infant mortality in Pakistan, accounting for more than 20% of all infant deaths. This study was conducted to know the frequency of the congenital malformations associated with increasing maternal age so that awareness among the people might be induced that at which rate congenital malformation s may occur at increased age and measures to prevent the malformations can be planned.

This study might provide some reassurance to women who want to delay bearing a child. Dysmorphology is the study of abnormalities of human form and the mechanisms that cause these abnormalities. It is estimated that 1 in 40, or 2.5% of newborns, have a recognizable malformation or malformations at birth.

playing a significant role in neonatal mortality and morbidity (Rabah, 2011).

In addition, under ascertainment bias could have also affected our results due to non-reporting of family history because of shame, etc. A family history of birth defects has been associated with an increased risk of having another child with congenital anomalies, with a recurrence rate ranging between 2 and 5% and 1% for neural tube defects and Down syndrome respectively (Zīle and Villeruša, 2013).

Objectives

To determine various risk factors responsible for such malformations and evaluate if increasing maternal age is an independent risk factor for major congenital anomalies diagnosed at the time of second trimester anatomic survey, in the absence of aneuploidy.

MATERIALS and METHODOLOGY

A cross sectional, descriptive study was conudected at Paediatrics wards of Services Hospital Lahore and Children Hospital Lahore.390 infants with congenital malformations and their mothers admitted to the Paeds wards of Services Hospital Lahore and Children Hospital Lahore were included in our study through Non-probability convenient sampling technique was applied to this research. Subjects were explained the purpose and process of the study.

Table 1. Frequency Distribution for Type of defect (n=390)

Type of Defect	Number	Percentage	M	F	A
Cardiovascular defects	104	27%	47	57	-
•VSD	31	7.9%	17	14	-
•ASD	25	6.4%	07	18	-
•PDA	21	5.3%	08	13	-
•TOF	18	4.6%	08	10	-
•Cystic Hygroma	09	2.3%	04	05	-
•Abdominal lymphangioma	07	1.8%	03	04	-
Gastrointestinal Defects	92	23.5%	51	41	-
•Perianal Sinus	16	4.1%	10	06	-
•Anteriorly placed Anus	10	3.33%	08	02	-
•BIH	18	4.6%	07	11	-
•Neonatal cholecystitis	08	2.1%	05	03	-
•HSD	39	10.0%	21	18	-
Central Nervous System Defects	78	20.0%	37	41	-
•Meningocele	23	5.9%	11	12	-
•Meningomyelocele	16	4.1%	07	09	-
•Hydrocephalus	30	7.7%	15	15	-
•Frontocele	09	2.3%	04	05	-
Musculoskeletal Defects	39	10.0%	23	16	-
•Premature Closure of cranial Sutures	17	4.4%	11	06	-
•AV malformation of limbs	09	2.3%	05	04	-
•Torticollis syndrome	13	3.33%	06	07	-
Urogenital System Defects	39	10.0%	11	15	13
•Hydrocele	15	3.8%	07	08	-
•Ambiguous genitalia	13	3.33%	0	0	13
•Hypospadias	11	2.8%	04	07	-
Endocrine System Defects	24	6.6%	06	18	-
•CAH	24	6.6%	06	18	-
Respiratory System Defects	14	3.6%	08	06	-
•TEF	14	3.6%	08	06	-

Hirschsprung disease (HSD) was the most frequent anomaly in the selected population

In about half the cases a single malformation is found, while the other half display multiple malformations. Generally, congenital anomalies that involve the CNS and the cardiovascular and musculoskeletal systems have been reported to be the most common (Taksande *et al.,* 2010). As many infectious diseases have been controlled by use of vaccines and antibiotics, congenital anomalies are increasing

They were explained the benefits of the study. Assurance was given to protect the life, health, privacy and dignity of human study subjects. A questionnaire was developed in keeping with the study objectives and questions were directed at the maternal age, type of congenital malformation, any genetic predisposition, exposure to radiations, consumption of alcohol or smoking, exposure to viral infections such as Rubella, Cytomegalovirus, Herpes virus etc. during pregnancy, syphilis

or toxoplasmosis duringpregnancy and other risk factors for congenital malformations.

SPSS version 20 computer software was used for the entry complications and analysis of data. Descriptive and cross-sectional stat was applied on the data. Chi- square test of significance was applied on the data.

RESULTS

A total of 390 mothers of the patients were interviewed for the research according to our sample size. Out of 390, 46.9% babies were male, 51.1 were female and 3.0% babies with ambiguous sex in whom sex was not yet established.

Table 2. Frequency Distribution of Congenital malformations According to Maternal Age Groups

Age Group	No. of Cases	Male	Female	Ambiguous	P value
18-25	39	24	15	-	P = 0.086
26-33	223	97	113	13	P = 0.004
34-41	37	23	14	-	P = 0.081
42- above	91	39	52	-	P = 0.213
Total	390	183	194	13	

Maternal age group (26-33 years) showed increased incidence of congenital malformations i.e., 223 cases out of 390.

Table 3. Frequency Distribution according to Maternal Vaccination Status for TORCH

Vaccination Status	No. of Mothers	Percentage
Vaccinated	137	35.5%
Not Vaccinated	263	64.5%
Total	390	100%

The most frequent anomaly was Hirschsprung Disease which was found 10% in the interview population. 26.6% patients presented with cardiovascular defects (making it most frequent system involved) 23.3% patients were presented with gastrointestinal defects, 9.7% patients presented with musculoskeletal, and 20% patients were presented with central nervous system defects. Only 3.5% patients presented with respiratory system defects while 10.5% patients presented with and urogenital defects. Hirsch sprung Disease was found the most common anomaly in the patients.

DISCUSSION

Congenital anomalies if overt can be picked up easily at birth by trained pediatricians, anomalies like congenital defects of the heart are apparent in seven to ten days even if not apparent at or soon after birth. Sometimes patient are informed beforehand about the anomalies on antenatal ultrasounds, most common of these include hydrocephalus GIT anomalies, heart defects, and anomalies of the lungs so that antenatal counselling can be done and necessary management plans can be laid out. We found that maternal age >25 years was associated with greater birth prevalence of congenital malformations, especially in the earlier cohort. Advanced maternal age, then, is likely associated with yet-unidentified factors.

Association of congenital malformations with low birth weight, premature birth or other developmental anomalies has led to calls for future research in prevention intervention and identifying genetic risk and predisposition. A study conducted on congenital malformations among newborns in Kenya reported that most common anomalies involved the musculoskeletal system followed by anomalies of the CNS, among which hydrocephalus was most common followed by anencephaly and microcephaly and then chromosomal in which Down's syndrome was very common. Polydactyly was found to be single most common malformation. More males than females were observed but difference was not statistically significant (Randy, 2014). The impact that the decision to delay childbearing has on maternal and perinatal outcomes become increasingly relevant as more and more women postpone having children until they are over the age of 35. There are numerous reports in the literature assessing the effect of advancing maternal age on pregnancy outcomes, but results are varied (Rosano et al., 2000).

Conclusion

In conclusion, concerning congenital malformations, our analysis didn't confirm our assumption that the increasing mother's age is associated with increased incidence of congenital malformations. The impact of a higher mother's age on other chromosomal anomalies was not found to be so strong, as we initially hypothesized. It was pretty amazing to find out that our data analysis was contrary to previously conducted researches. So, according to our research, older maternal age in itself does not produce noticeable extra risk for non-chromosomal birth defects overall. Young and advanced maternal ages are associated with different types of birth defects but underlying causes for these associations are not clear.

REFERENCES

Ana and Bento, 2013. Congenital pancreas malformations: a clinical case report. *Rev. Assoc. Med. Bras*, 59, 1-4.

Brice, P. 2013 .Consanguinuity and older mothers increase risk of birth defects* Published on July 8- [and older mothers increases risk of birth defects] Available at:http://www. phgfoundation.org/news/14288/. Last accessed: 22nd Feburary, 2018.

Charlton, RA. 2010. Identifying major congenital malformations in the UK General Practice Research Database (GPRD): a study reporting on the sensitivity and added value of photocopied medical records and free text in the GPRD. *Drug Saf*, 33(**9**), 741-50

Cleary, J. 2005. Impact of Maternal Age on Obstetric Outcome. *Obstet Gynecol*., 105, 983–90.

Dolk, H. 2013. All You Older Moms Are Causing The World Massive Birth Defects, Says Study. https://nypost.com/

2013/09/28/outdated-studies-feed-false-panic-about-older-moms-to-be/,Last accessed: 22ndFeburary, 2018.

Dr. Nathan – [Risks of Birth Defects]- (http://www.babyzone.com/pregnancy/fetal-development/birth-defects-risks_70721)

El Koumi, M.A., Al Banna, E.A. and Lebda, I. 2013. Pattern of congenital anomalies in newborn]: a hospital-based study. *Pediatr Rep*., 5(1), 0-3.

Goetzinger, K.R., Shanks, A.L., Odibo A.O., Macones, G.A. and Cahill, A.G. 2017. Advanced Maternal Age and the Risk of Major Congenital Anomalies. *Amer J Perinatol*., 34(03), 217-222.

González-Andrade, F. and López-Pulles, R. 2010. Congenital malformations in Ecuadorian children: urgent need to create a National Registry of Birth Defects. *The Application of Clinical Genetics*, 3, 29–39.

Gourbin, C. (2013). Impact of parental ages and other characteristics at childbearing on congenital anomalies: Results for the Czech Republic, 2000-2007.

Herbert, A.O. 2012. - Published on 10 July 2012-[Congenital malformations among newborns admitted in the neonatal unit of a tertiary hospital in Enugu, South-East Nigeria - a retrospective study. *BMC Res Notes*, 10;5,177.

Hollier, LM., Leveno, KJ., Kelly, MA., MClntire, DD. and Cunnigham, FG. 2002. Maternal age and malformations in singleton births. *Obstetrics and gynecology*, 96:5, 701-6.

Jarrett, K. Advanced Maternal Age - Chorionic Villus Sampling (CVS). (2001). Handbook of Genetic Counseling. Available at: https://en.wikibooks.org/wiki/Handbook_of_Genetic_Counseling/Advanced_Maternal_Age_-_Chorionic_Villus_Sampling_(CVS).

Katherine, R. G. 2014. Major Congenital Anomaly Risk Down for Older Moms. Available at: http://www.stlouischildrens.org/health-care-professionals/publications/doctors-digest/marchapril-2014/study-shows-lower-risk-fetal-a#main-content-area. Last accessed: 22ndFeburary, 2018.

Luo, L.Y. 2013. Maternal Age, Parity and Isolated Birth Defects: A Population-Based Case-Control Study in Shenzhen, China. *PLoS ONE,* 8(11): e81369. https://doi.org/ 10.1371/journal.

Mashuda, F., Zuechner, A., Chalya, P. L., Kidenya, B. R. and Manyama, M. 2014. Pattern and factors associated with congenital anomalies among young infants admitted at Bugando medical centre, Mwanza, Tanzania. BMC Research Notes, 7, 195. http://doi.org/10.1186/1756-0500-7-195.

Moore, K.L. and Persaud, T.V.N. 2003. Human birth defects: In the Developing Human: Clinically Orientated Embryology. Philadelphia: Saunders,7, 157-186.

Muga, R.O., Mumah, S.C.J. and Juma, P.A. 2009. Congenital malformations among newborns in Kenya. *Afr J food Agri Nutr Dev,* l9,819–29.

Murray, J.C. 2002. Maternal age and oral clefts. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod,* 94(5),530-5.

Ooki, S. 2013. Maternal age and birth defects after the use of assisted reproductive technology in Japan, 2004–2010. *International Journal of Women's Health*, 5, 65–77.

Parmar, A. 2010. A Study of Congenital Anomalies in Newborn. *Natl J Integr Res Med*, 1(1), 13-17

Rabah, M.S. 201). Congenital malformations prevalent among Egyptian children and associated risk factors, *Egyptian Journal of Medical Human Genetics*, 2, 69-78.

Randy, D. 2014. Babies Born to Moms Over 35 & Birth Defect Risk.Web MD News from Health Day. Available at: https://www.webmd.com/baby/news/20140203/babies-born-to-moms-over-35-may-have-lower-risk-for-certain-birth-defects#1. Accessed 22ndFeburary, 2018.

Raza, F. 2010. Maternal age and the risk of structural congenital anomalies. *Arch Dis Child Fetal Neonatal*., 95,1.2.

Rosano, A., Botto, L.D., Botting, B. and Mastroiacovo, P. 2000. Infant mortality and congenital anomalies from 1950 to 1994: an international perspective. *J Epidemiol Community Health,* 54,660–6.

Singh, A. and Gupta, RK. 2009. Pattern of congenital anomalies in newborn: a hospital based prospective study. *JK Sci*., 1,34-36.

Taksande, A., Chaturvedi, P. and Jain, M. 2010. Congenital malformations at birth in Central India: A rural medical college hospital based data. *Indian J Hum Genet*.**,** 16(3),159-63.

Tennant, P.W.D. 2010. Maternal age and the risk of structural congenital anomalies. *BMJ*, 95, 1 – 8.

Zīle, I. and Villeruša, A. 2013. Maternal age-associated congenital anomalies among newborns. *Medicina,* (Kaunas), 49(1), 29-35.

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