Pattern of Distribution of Congenital Anomalies in the Newborn in Damietta General Hospital

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Abstract

The study was conducted at Damietta general hospital in the period from 1/ June/ 2015 till 31/ May/ 2016, 50 cases of neonates borne with dysmorphologic congenital anomalies and 50 control neonates were included in the study, Mothers of cases and controls were interviewed face to face, the pre- performed structured questionnaire was used, information were collected about families socio- demographic characteristics, life style, habits, history of chronic illnesses, long term medications, exposure to expected risk factors (toxic substances, industrial hazards, environmental factors), consumption of certain foods, thorough general and systemic examination for included cases and controls, some investigations were done when needed. R esults showed that the number of babies borne with dysmorphologic congenital anomalies in Damietta general hospital during the period from 1/June/ 2015 till 30 May 2016 was 50 cases out of 1823 deliveries (1063 cesarean deliveries and 760 vaginal deliveries), this means that the prevalence rate was 2.7%

Systemic distribution of these anomalies was: digestive system anomalies 30% (the most common diagnosis among studies cases was tie tongue representing 28% of cases), musculoskeletal anomalies 20%, skin anomalies 14%, eye, ear, face and neck 10%, cardiovascular system anomalies 10%, genital organs anomalies 8%, cleft lip and palate 4%, Chromosomal abnormalities 2%.

The study showed that there is an increased risk of dysmorphologic congenital anomalies as: Parental Smoking (active paternal and passive maternal) (OR= 5.78), frequent fish intake (2times and more/ week)(OR= 4.89), high tendency to: legume intake (OR= 19.12), Canned foods intake (OR= 6.52), frozen food intake (OR= 6.52), Fast foods intake (OR= 3.08).

Keywords: dysmorphologic, congenital, anomalies, Damietta, Newborn.

معدل ونمط انتشار وعوامل الخطورة المرتبطة بالتشوهات الخلقية فى حديثى الولادة بمستشفى دمياط العام خلال عام واحد

أجريت الدراسة فى مستشفى دمياط العام فى الفترة من ١ يونيو ٢٠١٥ حتى ٣١ مايو ٢٠١٦، شملت الدراسة ٥٠ حالة من حديثى الولادة الذين ولدوا بتشوهات خلقية شكلية ومجموعة ضابطة تشمل ٥٠ من الأطفال حديثى الولادة المولودين بنفس المستشفى وفى نفس الفترة الزمنية ولا يعانون من أية تشوهات خلقية، تمت مقابلة أمهات الحالات والضوابط وجها لوجه، تم استخدام استبيان معد مسبقا، وجمعت المعلومات عن الخصائص الاجتماعية والسكانية للأسرة، وأنماط الحياة، والعادات، وتاريخ الأمراض المزمنة، واستخدام الأدوية على المدى الطويل، والتعرض لعوامل الخطر المتوقعة (المواد السامة والمخاطر الصناعية والعوامل البيئية)، والإقبال على استهلاك بعض الأطعمة المحددة، وتم إجراء فحص عام شامل وفحص لأجهزة الجسم للحالات والضوابط، أجريت بعض الفحوصات المعملية والإشعاعية عند الحاجة.

أظهرت الدراسة أن عدد الأطفال الذين ولدوا يعانون من تشوهات خلقية فى مستشفى دمياط العام خلال الفترة من ١/ يونيو ٢٠١٥ حتى ٣٠ مايو ٢٠١٦ كان ٥٠ حالة من أصل ١٨٢٣ ولادة (١٠٦٣ ولادة قيصرية و٧٦٠ ولادة طبيعية)، وهذا يعنى أن كان معدل الانتشار ٢,٧%

وكان التشخيص الأكثر شيوعا بين حالات الدراسة هو اللسان المربوط الذى يمثل ٢٨% يليه زيادة عدد أصابع اليد بنسبة ٦% يلى ذلك تشوهات بالعديد من أجهزة الجسم بنسب مختلفة.

أظهرت الدراسة أن هناك عوامل خطر تزيد من فرص حدوث التشوهات الخلقية مثل: التعرض للملوثات البيئية الصناعية، تقدم سن الأب (أكثر من ٣٥ سنة)، مشاهدة التليفزيون لساعات طويلة (أكثر من أربع ساعات) يوميا، التدخين الأبوى، وكثرة تناول: الأسماك (مرتان فأكثر أسبوعيا)، البقوليات، الأطعمة المعلبة، الأطعمة المجمدة، الأغذية المجمدة والوجبات السريعة، وكذلك زواج الأقارب والتعرض للمواد المستخدمة فى طلاء الأثاث.

توصى الدراسة بوضع خطط واستراتيجيات للوقاية والتشخيص المبكر للتشوهات الخلقية على أن تشمل المناطق الريفية والحضرية على حد سواء، وتنفيذ برامج تثقيفية لتحسين وعى الجمهور بالتشوهات الخلقية وعوامل الخطر المحتملة.

Introduction:

According to the World Health Organization (WHO) document of 1972, the term congenital anomalies has to be limited to structural defects at birth.[1] However, according to the more recent WHO fact sheet of October 2012, congenital anomalies can be defined as: structural or functional anomalies including metabolic disorders that are present at the time of birth.[2]

Most of the Congenital anomalies are thought to have a multifactorial inheritance caused by interactions between genetic and environmental factors which are generally unknown, these diseases are named complex diseases. This interaction between genetic and environmental factors lie behind the etiological heterogeneity of these anomalies, implementation of more researches about genetic environmental interactions will result in better understanding of the biological mechanisms and pathological pathways that share in the development of complex congenital anomalies. On the light of this understanding more efficient measures can be developed to prevent these severe costly and often fatal anomalies.[3]

Despite of the frequency of congenital anomalies, the accurate underlying reasons for most remain ambiguous. It has been estimated that about (15%- 25%) are due to well known genetic conditions (Chromosomal and single gene causes), (8%- 12%) are due to environmental factors (Maternal- related conditions, drugs or chemicals exposures) and (20%- 25%) are due to multifactorial inheritance. While the majority (40%- 60%) of congenital anomalies are of unknown etiology.[4]

Aim Of The Study:

This study aims to assess the frequency and distribution and associated risk factors of dismorphologic congenital anomalies in live newborns and stillbirths in Damietta general hospital in a period of one year, and to evaluate their correlates.

Subjects And Methods:

- Type of study: A cross sectional descriptive study carried out in the neonatal care unit of Damietta general hospital during the period of one year, from 1st June 2015 till 31st May 2016.
- Inclusion criteria: All newborns delivered with dysmorphologic congenital anomalies in Damietta general hospital during the above mentioned period were included, the study also included fifty (Equal to number of cases) age matched healthy children serving as control subjects.
- Ethical consideration: The protocol of the study was approved by ethics committee in Institute of Postgraduate Childhood Studies, A written consent was taken from the sponsor (Father or Mother), after a discussion with them about the study and its expected importance for the community.
- Tools: A questionnaire was designed as guided by (Guillham, 2000), (McColl, et.al., 2001), the questionnaire was tried then applied.
- The included newborns were subjected to: Thorough history taking, Thorough medical general examination and systemic examination, laboratory and radiological investigations.
- Statistical Analysis: Data was statistically analyzed into SPSS ver. 16 and appropriate statistical analysis was performed. Results were analyzed by simple statistical techniques recording number and percentage of cases.[5]

Results:

The study showed that number of babies borne with dysmorphologic congenital anomalies in Damietta general hospital during the period from 1 June 2015 till 31 May 2016 was 50 cases out of 1823 deliveries (1063 cesarean deliveries and 760 vaginal deliveries), this means that the prevalence rate was 2.7%.

The systemic distribution of these anomalies is shown in Table (1) which shows that the most common diagnosis among studies cases was tie tongue representing 28%, polydactyl hand by 6% of cases, then (Aposthia, Port wine navus, Unilateral microtia, Bilateral incomplete cleft lip, Unilateral talipus equinovarus, Bilateral Preauricular skin tags, Atrial septal defect, Hypospadius) by 4% each, and lastly Unilateral Preauricular skin tags, Ophthalmo- acromelic syndrome, Unilateral anophthalmia, Bilateral anophthalmia, Dermoid cyst, Polydactyl foot, Port wine navus hand, Retracted chest, Phocomelia- Acheiria, Bilateral Congenital hip dislocation, Achondroplasia, Down syndrome, ASD+ Lt Pulmonary artery branch stenosis, ASD+ventricular septal defect, Patent foramen oval+ patent ductus arteriosus, Patent foramen oval+ patent ductus arteriosus, oesophageal atresia (Stillbirth) by a 2% for each.

Table (1) Diagnosis of congenital anomalies among studied cases

Congenital Anomalies	Frequency	Percent
Tie Tongue	14	28.0
Polydactly Hand	3	6.0
Aposthia	2	4.0
Port Wine Navus	2	4.0
Unilateral Microtia	2	4.0
Bilateral Incomplete Cleft Lip	2	4.0
Unilateral Talipes Equinovarus	2	4.0
Bilateral Preauricular Skin Tags	2	4.0
Atrial Septal Defects	2	4.0
Hypospadius	2	4.0
Unilateral Preauricular Skin Tags	1	2.0
Ophthalmo- Acromelic Syndrome	1	2.0
Unilateral Anophthalmia	1	2.0
Bilateral Anophthalmia	1	2.0
Dermoid Cyst	1	2.0
Polydactyl Foot	1	2.0
Port Wine Navus Hand	1	2.0
Retracted Chest	1	2.0
Phocomelia- Acheiria	1	2.0
Bilateral Congenital Hip Dislocation	1	2.0
Achondroplasia	1	2.0
Down Syndrome	1	2.0
ASD + Lt PA branch stenosis	1	2.0
Asd+Vsd	1	2.0
Patent foramen oval + patent ductus arteriosus	1	2.0
Patent foramen oval + patent ductus arteriosus	1	2.0
Oesophageal Atresia (Stillbirth)	1	2.0
Total	50	100.0

Figure (1) showing that there is a history of smoking in 62% of cases versus 38% of cases without any history of smoking.

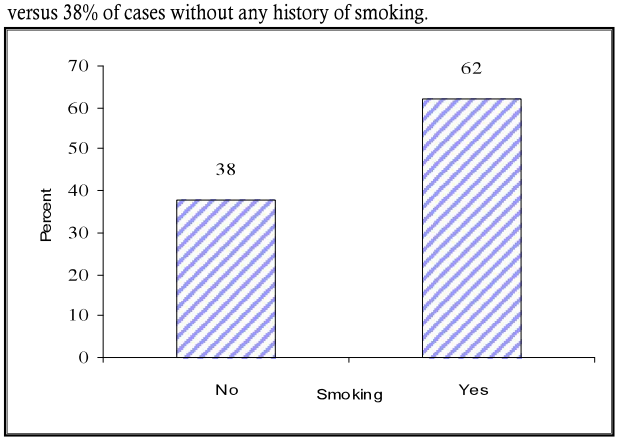

Figure (1) History of smoking among parents of studied cases

Table (2) showing that there is a history of legumes consumption in 45% of parents of studies cases, and no legume consumption in 5% of cases.

Table (2) legumes consumption among parents of studied cases

Legumes Consumption	Frequency	Percent
Yes	45	90.0
No	5	10.0
Total	50	100.0

Table (3) showing that 48% of cases have fish three times weekly in their meals, 30% of cases have fish twice weekly in their meals, 22% of cases have it once weekly, while no case don't have it in meals.

Table (3) Fish consumption per week among parents of studied cases

Fish Consumption Per Week	Frequency	Percent
Once Weekly	11	22.0
2 Times/ Week	15	30.0
3 Times/ Week	24	48.0
None	0	0.0
Total	50	100.0

Discussion:

When a family have a newborn with a dismorphlogic congenital anomaly this represents a source of disappointment and stress, the family members always ask about the causes of and impact of such anomaly on growth and development of the child, the possible treatment and the chance of future offspring to have similar condition.

In the current study prevalence of disomrphologic congenital anomalies was 2.7% distributed as follows: 54% (1.4%) in urban and 46% (1.2%) in rural areas, a study conducted in Ain Shams university.[6] showed that the prevalence of congenital and genetic disorders (among infants and young children) in Egypt is estimated to range from 2.8% in urban areas in metropolitan governorates to 8.4% in rural areas in Upper Egypt, another one year study in Zagazig university hospital showed that the prevalence of congenital and genetic disorders was 2.5% and the musculoskeletal system (23%) was the most commonly involved.[7]

In our study there are some risk factors have a relationship with congenital anomalies.

Nutritional factors are a part of the etiology of congenital anomalies,[8] Deficiencies of protein, vitamins, other micronutrients specially folic acid are associated with increased risk of congenital anomalies.[9] This study showed increased tendency of parents of affected children to have fish in their diet, this is in accordance with a study of Assem O et.al,[10] which showed that fish is a potential mean for organochlorine contaminants and another study of José G. Dórea,[11] which showed that fish is a potential rout for toxic materials that affect reproduction and development and endocrinal glands e. g pesticides so there is an increase in all major malformations with having fish in the rate of 2 ore more meals per month during pregnancy.

On the other hand a study of Elizabeth Lees,[12] showed that fish consumption may be beneficial for development of the foetus.

The current study showed increased tendency of parents of affected children to have legumes in their diet, legumes are considered a cheap source of protein which a good percentage of families depend on in their meals, the association may be that legumes are stored in unhealthy ways being exposed to contamination and high temperature and humidity which helps in the growth of Aflatoxin, which is not destroyed by cooking temperature, it is mutagenic, carcinogenic and teratogenic,[13] and induces chromosomal aberrations,[14] Legumes contain phytoestrogens which are estrogenic compounds of plant origin, these compounds are transferred from mother to foetus and affect estrogen metabolism and action in the foetus.[15]

The current study showed that there is an association between paternal smoking and congenital anomalies, this is in accordance to another study of De Santis et.al,[16] all mothers of studied cases were non smokers, the explanation may be that they are subjected to negative smoking, or because Smoking causes DNA mutations in the germ line of the father, which can be inherited by the offspring. Cigarette smoke acts as a chemical mutagen on germ cell DNA. The germ cells suffer oxidative damage, and the effects can be seen in altered mRNA production, infertility issues, and side effects in the embryonic and fetal stages of development. This oxidative damage may result in epigenetic or genetic modifications of the father's germ line. Research has shown that fetal lymphocytes have been damaged as a result of a father's smoking habits prior to conception.[17]

The study concluded that faulty habits and unhealthy life styles and lack of health awareness are the deep roots of risk factors of congenital anomalies, studying congenital anomalies and their risk factors is a wide spectrum for additional studies that may help in putting plans for prevention of congenital anomalies.

Conclusion:

1. Incidence of dysmorphologic congenital anomalies in the newborn in Damietta general hospital was 2.7% (50 cases out of 1823 deliveries) distributed as follows: 54% (1.4%) in urban and 46% (1.2%) in rural areas
2. There are several factors have an association with this incidence of congenital anomalies, which include: Paternal smoking, High tendency to fish intake fish intake (2 times and more/ week), High

tendency to legume intake (2 times and more/ week).

3. Some congenital anomalies are of unknown etiology.

Recommendations:

1. Cooperation between public health departments and mass media to establish health education programs to elevate the level of public health awareness, the target of these programs must be rural and urban areas
2. Integration of a national primary prevention program with the primary health care level
3. Primary preventive measures both pre and peri- conceptional:
   a. Elevation of public health awareness about hazards of smoking.
   b. Fortification of food with essential micronutrients.
   c. Avoidance of exposure of pregnant women to environmental pollution and teratogenic agents (e.g: X- ray, pesticides, …).
   d. Genetic Counseling.
   e. Vaccination against rubella and German measles.
4. Establishment of a special record for registry of newborns with congenital anomalies in obstetric departments in every hospital to facilitate conduction of further researches and epidemiological studies.

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