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Research Article

Research of the Causes and Risk Factors of Autism in the Western Region of Algeria

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ABSTRACT

Introduction Autism is a neurodevelopmental disorder that manifests before 3 years old and affects many areas, communication, social interactions and behaviors. In Algeria, there has not yet been a regional or national epidemiological investigation concerning autism spectrum disorders.

Materials and methods: Our study was carried out about 100 patients (autistic children) in the western region of Algeria, in order to determine the different risk factors involved in the onset of autism syndrome.

Results and discussion: The obtained results indicate a male predominance with a sex ratio of 4: 1 and the degree of reached is average in 44% of patients. 42% of the patients are youngsters. Parents' worry about their children begins between 24 and 36 months. The parents' advanced age at conception, stress, presence of certain pathologies and drug intake by mothers, as well as fetal distress at birth and children's exposure to screens were the main risk factors. Repetitive movements, lack of social communication, language delay, and lack of visual fixation were the main clinical symptomatology.

Conclusion: This study allowed us to detect the main factors associated with the onset of autism. However, the results obtained cannot be generalized to the entire population.

Keywords: Autism, autism spectrum disorder, risk factors, clinical symptoms, western region of Algeria.

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1 INTRODUCTION

Autism is a neurodevelopmental disorder, first described medically by Kanner in 1943. The WHO International Classification of Diseases (ICD-10) describes autism as a pervasive developmental disorder, defined by a qualitative alteration of communication, socialization and the presence of stereotypical behaviors and restricted interests. The disorders must have appeared early in early childhood and pervade the person's entire functioning ¹

Two reference classifications, (ICD -10 and DSM-5, also highlight the heterogeneity of autism, and are the subject of regular updates reflecting the advances made in knowledge of autism, are internationally recognized by the scientific community. There is also a French Classification of Mental Disorders in Children and Adolescents (CMDCA) ².

Autism affects three to four times as many boys as girls and affects 1 in 160 children worldwide according to the latest WHO

estimates ³. In Algeria, studies have found that the number of cases of autism is between 400,000 and 500,000 cases ⁴. The increased frequency of autism in recent decades is a major problem of public health. As a result, several studies have been carried out to identify the neurological, genetic, parental and environmental factors involved in the complex and multifactorial aetiology of this disease ⁵. To date, there is no reliable biological or imaging marker available to diagnose autism. The diagnosis is therefore made exclusively by clinical evaluation of subjects ⁶. The main objective of our study is to determine the risk factors and causes involved in the onset of autism, namely genetic, socioeconomic, and medical factors in young children living in the western region of Algeria (Sidi Bel Abbes, Oran and Tlemcen).

II MATERIAL AND METHODS

Our study has several objectives, the main one is to look for the causes and risk factors involved in the onset of autism, namely genetic, socio-economic factors, maternal health and medical history in young children residing in the Algerian West region Sidi Bel Abbès, Oran and Tlemcen, generate hypotheses about the cross-cause (s) responsible for this disorder

II.1 Study framework:

The study was carried out for four months (March-June 2019). The informations collected on the patients was gathered from a questionnaire, filled in by the parents of autistic children residing in the western region of Algeria. Our study was carried out in three localisations:

In sidi Bel Abbès city, the work was carried out in the child psychiatry department, private schools and a private speech therapist, in Oran city it was with a private speech therapist and finally the city of Tlemcen the work was realised in a private school.

II.2 Study population:

The study involved a sample of one hundred (100) autistic patients. The approach adopted for this study took into consideration several parameters in order to determine the factors having an influence on the appearance and / or evolution of autistic disorders.

Among the factors taken into account, we cite: age and sex of patients, order of birth, state of health of the child at birth and other associated pathologies, lifestyle, age of parents, consanguineous marriage, the mother's medical history, the mother's exposure to toxic substances, type of childbirth, type of breastfeeding, family history of autism, diagnosis and finally therapeutic and social care

II.3. Data analysis :

The data collected was computerized and processed with IBM SPSS software (version 22). Chi-square test analysis is performed for significance check ($p < 0.05$), followed by frequency analysis to calculate the percentage

III. RESULTS AND DISCUSSIONS

III.1 Breakdown by Age

From figure 1, we can deduce that patients aged 6 years are the most affected at 48% with extremes of 4 years and 11 years and an average age of 6.10.

Figure 1 : Breakdown by Age

III.2 Breakdown by gender

Our results show that among the 100 autistic children, 79 are boys and 21 are girls with a male predominance and a sex ratio of 4: 1 (fig 2).

Figure 2 : Breakdown by gender

III.3 Rank in siblings

Our result (figure 4) reveals that the large number of patients affected by ASD are binjamin at 42% followed by Elder children with percentage of 27%, as well as alone child and cadets with a rate of 15%.

Figure 3 : Rank in siblings

III.4 Distribution by degree of autism

The histogram below shows that the most found degree of autism is the average degree with a percentage of 44%. For the others we obtained a rate of 24% for mild autism and 12% for severe autism (fig 4).

Figure 4 : degree of autism

III.5 symptoms of autism

The table below shows that the majority of the symptoms are present in our patients with a significant percentage.

Table 1 : symptoms of autism

Symptoms	Yes %	No %
Repetitive movements (stereotypy)	83	16
Withdrawal or lack of social communication	88	12
Absence or delay of language	80	20
Absence or reduction of the sensory aspect	58	42
Absence or lack of pointing	78	22
Absence or lack of demand	86	14
Absence or lack of visual fixing	83	17
Angry outbursts and aggressive gestures directed against oneself and others	46	53
inability to play symbolic games	62	37
loss of words or sentences already acquired after vaccination	14	86

III .6 Child Health status at birth

In our population, 29% of the children suffered fetal distress, 44% had low birth weight and 11% had neonatal jaundice, in the end 4% of the cases were premature.

Figure 5 : child Health status at birth

III .7 Physical and psychological development of the autistic child

Histogram below represents the state of the child in the phase of normal development, it has been observed that a large number of patients had a delay in psycho-affective (83%), psychomotor (65%) and postural (52) development as well as a delay in weight (23%) and statural (4%) growth.

Figure 6 : Physical and psychological development of the autistic child

III.8 Early accidents of autistic children

In our population a large number of 74% have not had accidents during early childhood, as well as 15% have had falls, 7% have had traumas and 4% have had psychic shocks.

Figure 7 : Early accidents of autistic children

III.9 Overexposure to the screens and autistic syndrom

85% of our patients were exposed to screens while 32% were exposed between 4 to 8 hours, 27% were in front of screens for less than 4 hours and 26% for more than 8 hours, in the end, 15% have not been identified.

Figure 8 : Overexposure to the screens and autistic syndrom

III.10 parents' first concerns

The results below indicate that about 51% of parents note that their children's attitudes and behaviours are strange at ages between 44 and 33 months. It is at this point that parents begin to understand the seriousness of the problem.

Figure 9: parents' first concerns

III. 11 parental Age at birth of their children

The results obtained for the parental age at the birth of their children are shown in the table below; however, the average age of fathers was 36.44, with extremes of 43 and 78, and the average age of mothers was 30.86, with extremes of 19 and 40.

Table 2: parental age at birth of their children

	The average	Standard deviation	Extreme age
father	36.44	7.260	23- 78
mother	30.86	4.934	19-40

Figure 10 : Maternal Stress

III. 12 Maternal Stress

Stress is a complex term that encompasses a large number of reactions, but mothers in general may not be aware that stress during pregnancy is also a risk factor that can have a significant impact on the developing fetus. including the health, development and function of the immune system. Figure 10 shows that 57% of mothers of autistic children suffer from a stress disorder

III.13 Relationship between Maternal Stress and the degree of autism

We can see on the histogram below, that there is a significant correlation ($P = 0.011$) between the degree of autism and the stress of the mother, a large number of children have an average degree of autism (43%), followed by a mild degree with a percentage of 19% and 7% a severe degree.

Figure 11 : Relationship between Maternal Stress and the degree of autism

III. 14 Mother's pathologies associated with autism

Only 30% of mothers presented illnesses, 6% had anemia followed by a percentage of 5% for mothers who presented infections during pregnancy and hypertension during pregnancy,

thus 3% with thyroid pathology, 2% for type 1 and type 2 diabetes and a percentage of 1% of mothers had asthma and also 1% for mothers who presented a combination of two diseases such as anemia and fever, asthma and pregnancy-induced hypertension, gestational diabetes and infection.

Figure 12 : Mother's pathologies associated with autism

III. 15 Care of autistic childrens

Our patients had multiple care, 34% received psychological, speech therapy and medication, 26% were followed up

psychologically and speech therapy, 15% were followed by the speech therapist alone, 12% received psychological care and 9% had received medication.

Figure 13 : Care of autistic childrens

IV DISCUSSION

According to the UN, Autism manifests itself in the first three years of life ⁷, our results have shown that children aged 6 are the most affected This difference can be explained by the late management of the autistic child, that is to say that parents' worries in general begin with the age of schooling.

Concerning distribution by gender our results are similar to ⁸ and ⁹. This imbalance between boy and girl can be explained by several factors:

Many genes located on the X chromosome have been used in autism. It could explain that girls would be protected against ASD compared to boys ^{10, 11}. The study conducted by ¹² report the existence of a female protective effect against the development of ASD, which would give girls a higher tolerance threshold than boys with regard to the expression of the pathology ¹³.

The role of sex hormones such as testosterone, which can increase the reduction in men to develop ASDs compared to women, has been mentioned ¹⁴.

Our results do not agree with the study of ^{15, 16} which estimates that the firstborns were most likely to be affected by autism. Rather, other studies ¹⁷ discovered that the youngest children are the most affected by autism.

Our results do not agree with the study by ^{15, 16} who estimate that firstborn children were the most likely to be affected by autism. Rather, other studies ¹⁷ who have found younger children are the most affected by autism.

Autism does not manifest with the same frequency and intensity in all patients. Each person has their own particularities. The nature and intensity of the disorders vary from one person to another and also vary over time in the same person, and may also change depending on the support offered. Thanks to good early and adapted educational care, an autistic child can progress quickly and have every chance of integrating into society ¹⁸.

Autism spectrum disorders are currently characterized by significant impairment in communication and social interaction, stereotyped and repetitive behaviours, and restricted interests ¹⁹. In 2005, the neuro-pediatrician Cuiss and his collaborators ²⁰ found that fetal suffering at the time of childbirth and prematurity were found in 40% of cases of pervasive developmental disorders a study conducted by ²¹ indicates that low birth weight is a risk factor for ASD.

A survey carried out by ²² showed that people born between the 28th and 30th week of pregnancy had a 7.3 times higher risk of

developing ASD than controls born at term. Another study by ²³ found that 9% of children with autism had neonatal jaundice, compared to 3% of children without autism. The authors explain that prolonged exposure to high levels of bilirubin can lead to developmental problems that can persist for the rest of a child's life.

There is No study speaks of a relationship between accidents in early childhood and autism. This result remains a hypothesis and may be a new sign in the world of autism.

Children with an Autism Spectrum Disorder are particularly vulnerable to various effects of screen time on the brain The Frampton Gwynett and his colleagues ²⁴ confirms our findings and indicates that screen exposure time is a risk factor for ASD ²⁵.

Regarding parents first concerns our results indicated that parents express their concern at all ages of their childrens and are much more significant between 44 and 33 months of age; however, other work ^{26, 27, 28}, show that parents generally begin to suspect developmental problems in their children between 12 and 24 months of age.

There is a significant association between the age of the child's parents at birth and the subsequent risk of developing an Autism Spectrum Disorder (ASD), Our results are consistent with ^{29, 30, 31} who showed that the increase in ASD was not only limited to advanced parental age, but also to the age difference between them. These same results detected a significant influence of parental age on the risk of autism.

Other Studies ^{32, 33}, confirm our findings, however, there is a strong link between high stress during pregnancy and the birth of an autistic child because it has a real impact on the pregnant woman and her fetus ³⁴.

Maternal disease may be a risk factor for ASD ³⁵ iron is essential for early brain development, however our results confirm the relationship between neonatal or maternal anemia, thyroid hormone levels, preeclampsia and ASD

According to the HAH, the objective of the care of autistic persons is to improve both their quality of life and that of their families. To do this, psychosocial approaches are implemented from childhood. Pharmacotherapy will only intervene in a second stage, only if psychosocial interventions have given an insufficient response in terms of behavioural improvement ³⁶.

CONCLUSION

Autism is a neurodevelopmental disorder that manifests itself before the age of 3 and affects several areas. The increase in the number of cases of autism in recent decades constitutes a real public health and sociological problem.

The objective of our study was to investigate the causes and risk factors involved in the onset of autism, namely genetic, socio-economic factors, maternal health and medical history in young children.

The analytical study of our population reveals that out of 100 patients with autism, 79 are male and 21 are female, a predominantly male prevalence with a sex ratio of 4:1.

We observed that the average degree of autistic severity predominates. Moreover, the children most affected by this disorder are the youngest with a rate of 44%, our results showed that parents' concern about their children begins at an age between 24 and 36 months.

We also found that the parents' advanced age at conception, stress, the presence of certain pathologies and the taking of medication by mothers, as well as fetal suffering at birth and the children's exposure to screens were the main risk factors. Nevertheless, the difficulties encountered during data collection do not allow us to have reliable results and to be able to draw conclusions.

The management of autistic syndrome is a child psychiatry issue, the neuropaediatric contribution is very complementary in the diagnostic process, a biological check-up is very necessary in order to search for an organic disorder at the origin of autism.

In perspective, it is very interesting to:

- Mention the Apgar score in health records and establish a reliable diagnosis in order to benefit from early treatment to ensure good follow-up and a better quality of life for these children.
- Create more parents' associations for a better awareness. To train specialized health personnel and to create a permanent contact between these professionals and the parents in order to ensure a good continuity of work with these children.
- Introduce new approaches that allow a better understanding of the molecular mechanisms responsible for autism.
- To carry out research on the different causes (genetic, environmental and biological) and consequences of this disease in order to contribute to changing public opinion's view of this handicap and to find possible therapeutic solutions to this disease.

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