Recognition of early warning signs and symptoms – the first steps on the road to Autism Spectrum Disorder diagnosis

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Abstract

Objective. To identify developmental symptoms reported at firsts doctor visits by parents of children later diagnosed with Autism Spectrum Disorder (ASD).
Design. Cohort study.
Setting. The study was conducted in the Department of Psychiatry Research of "Prof. Dr. Alexandru Obregia" Clinical Psychiatry Hospital from Bucharest between September 2019 and May 2021.
Patients. 105 cases: 82 boys and 23 girls, 100 children with autism, and 5 patients with Asperger's syndrome.
Intervention. ASD was diagnosed according to the DSM-5 criteria, ADOS-1 (Autism Diagnostic Observation Schedule, 1st Edition) and/or ADI-R (Autism Diagnostic Interview-Revised) tests scores; features reported by the parents for which they presented to the doctor for a diagnosis were taken into consideration.
Main outcome measures. The age at first presentation to the doctor; the most common early signs reported by the parents of children with ASD.
Results. The age at first presentation to the doctor in our group was between 9 months and 14 years. The most common early signs reported by parents were: delayed language development, deficits in understanding verbal instructions/indications, and hyperactivity and aggressivity. In the case of patients with Asperger's syndrome, the reported features were hyperactivity and aggressivity, learning difficulties, and social interaction problems. Regression and delay in language development occurred more often in boys than in girls.
Conclusions. Parents, as well as family doctors or paediatricians, should pay great attention to the children's behaviour, alongside their cognitive and language development. Early detection is essential for early intervention and our results can be used to develop training programs for parents and paediatricians for early recognition of ASD.

INTRODUCTION

Autism Spectrum Disorder (ASD) is a heterogeneous group of disorders characterized by a specific combination of social relationships and communication deficiencies, repetitive behaviours, restricted interests, and/or atypical sensory behaviours, with onset in early childhood [1]. The global prevalence of autism is now less than 1%, but estimates are higher in high-income countries [2]. The latest Community Report on Autism from the CDC (Centers for Disease Control and Prevention) states that 1 in 44 (2.3%) 8-year-old children were identified with ASD in 2018, a considerably higher figure compared to previous data [3, 4]. Among the mental health disorders specific to the pediatric population, ASD have been and are among the most studied, the definition, criteria, and methods of

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diagnosis changing very much over time. In Romania, so far, there is little data on children with ASD. From a historical perspective, the first depictions of autism spectrum traits in a group of children with disabilities have been mentioned by Rutter *et al.* which described "quasi-autistic models" in the well-known study on a group of institutionalized children in Romania [5, 6]. In another study that included children from institutions in Romania, Levin *et al.* demonstrated that early institutionalized education was associated with an increased risk of social communication difficulties and ASD [7]. Regarding the prevalence of ASD in Romania, so far, the research is limited [8]. In a study published in 2017, Budişteanu *et al.* identified 14.3% of children with ASD in a group of students aged 7-9 - 9,135 students from 122 regular schools and 95 special needs schools [9]. The increasing prevalence of Autism Spectrum Disorders (ASDs), together with more widespread media coverage on the subject has led to a greater number of parents paying more attention to their children's developmental milestones and expression of possible ASD symptoms and thus, presenting these concerns to their GPs or paediatricians earlier than before. Usually, ASD is diagnosed around the ages of 3-4 years [10]. Nevertheless, an increasing number of parents have started to present their concerns to their GP or paediatrician by the 18-months age of their children [11, 12]. The early recognition of the features specific for ASD is very important to apply an early intervention. In the diagnostic process, the role of the GP/paediatrician – the family's primary contact with the health system, is essential for a child who might be diagnosed with ASD. The diagnosis of autism is based on behaviours identified in the child at the time of presentation to the specialist. Although there is substantial heterogeneity between and within individuals throughout development, a set of basic diagnostic features of ASD (regarding social interaction, communication and restricted, repetitive behaviours) can be reliably identified by trained clinicians [13, 14]. Most importantly, early identification of ASD is essential for early access to targeted, evidence-based interventions that contribute to the improvement of long-term outcomes, with the paediatrician's early identification of these symptoms being the pivotal start of a hopefully-not-to-elaborate diagnostic process [15].

In this paper we will present our experience in the Department of Psychiatry Research at "Prof. Dr. Alexandru Obregia" Clinical Psychiatry Hospital in Bucharest, Romania, regarding children's developmental symptoms that concerned parents/caregivers report to their doctors which are actually early signs of ASD. Our intent is to provide useful information for GPs and paediatricians and raise awareness that certain developmental delays could be early ASD symptoms, in order to contribute to faster recognition of the disorder that cand lead to shorter diagnostic journeys for these families.

MATERIAL AND METHODS

The study was conducted in the Department of Psychiatry Research of "Prof. Dr. Alexandru Obregia" Clinical Psychiatry Hospital from Bucharest between September 2019 and May 2021 and the inclusion criteria were: children diagnosed with ASD according to the DSM-5 criteria, and together with the ADOS-1 (Autism Diagnostic Observation Schedule, 1st Edition) [13] and/or ADI-R (Autism Diagnostic Interview-Revised) scores, as well as the agreement of the legal representative to participate in the study, expressed by signing the informed consent. To identify the parents' concerns and the signs that they observed in their children at the beginning of their evaluation route, as well as their children's symptoms and history, we conducted structured clinical interviews with both parents or caregivers. In all children, we noted the gender and the age of the child, the age at diagnosis, and the symptoms reported by the parents for which they presented to the doctor for a diagnosis. Our purpose was to identify those symptoms which are the first that get the parents' attention when it comes to their child's development, be them a concern related to a possible ASD diagnosis or not. We wish to underline the fact that there are cases in which parents express worry towards symptoms that could be early ASD signs (such as delay in language development, deficits in understanding verbal instructions/indications, hyperactivity and aggressivity) but are sometimes overlooked in clinical settings and are not referred to a specialist for further evaluation, and thus an ASD diagnosis is sometimes missed or delayed, which consequently delays the start of the therapeutic intervention.

For statistical analysis we used IBM SPSS 22 statistical analysis program, JASP 0.14.1.0 and JAMOVI 1.6.21.0 software, Mann Whitney U Test and Fisher's Exact Test for mean difference. We used the confidence interval 95% CI and the statistical significance is accomplished for $p<0.05$. In addition, statistical significance is obtained when the p-value of the all tests is less than 0.05.

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of "Prof. Dr. Alexandru Obregia" Clinical Psychiatry Hospital (Protocol approval N. 33/26.11.2019).

The written informed consent was obtained from all subjects before participating in these studies.

RESULTS

The study included 105 patients (82 boys, 23 girls). The age interval of the children at the time of inclusion in the study was 9 months to 15 years (mean age=5.5 years/66.15 months, and a standard deviation (SD) = 3.63 years/43.62 months). The age at which the parents observed first manifestations and referred the child to a doctor for a diagnosis was between 9 months and 14 years, with a mean of 30 months and a standard deviation of 2.5 years/29 months.

In 95 cases the parents reported as the main reason for presenting to the doctor a delay in language development; in 49 children, deficits in understanding of orders; in 37 cases, hyperactivity and aggressivity; in 31 cases, lack of eye contact; in 23 children, repetitive behaviours/movements; and 20 children, lack of functional play (*Table 1*).

Table 1
Parents' expressed concerns in relation to diagnosis

Parents' expressed concerns	ASD	Asperger's Syndrome
Delay in language development		
Absent	5	5
Present	95	0
Deficits in understanding verbal instructions/indications		
Absent	51	5
Present	49	0
Hyperactivity and aggressivity		
Absent	63	4
Present	37	1
Lack of eye contact		
Absent	69	5
Present	31	0
Repetitive behaviours/movements		
Absent	77	5
Present	23	0
Lack of functional play		
Absent	80	5
Present	20	0
Does not point the finger		
Absent	95	5
Present	5	0
Regression		
Absent	87	4
Present	13	1
Learning difficulties		
Absent	98	3
Present	2	2
Difficulties in social interaction		
Absent	84	2
Present	16	3

ASD: Autism Spectrum Disorder.

Regarding the ASD type, 100 children had ASD and 5 patients were diagnosed with Asperger's Syndrome (technically no longer a diagnosis on its own, and called now a high-functioning type of ASD). If in the case of children with Asperger's Syndrome the most common early signs were hyperactivity and aggressivity, learning difficulties, and social interaction problems, in the case of children with ASD the most common early signs were delayed language development and deficits in understanding of orders (*Table 1*).

Thirty-eight patients with ASD were diagnosed within 9-24 months (30 boys and 8 girls), 50 patients with ASD were diagnosed within 25-48 months (36 boys and 14 girls), 11 patients with ASD were diagnosis between 49-72 months (10 boys and one girl), and one boy was diagnosed with ASD at the age of 73 months (*Table 2*).

Regarding the differences in the early signs in terms of age category at which the child with ASD was diagnosed, significant differences were found only in terms of delay in language development, deficits in eye contact, non-responsiveness, hyperactivity and aggression, learning difficulties and deficits in social interaction, p<0.05 (*Table 3*).

The deficits in understanding verbal instructions/indications (non-responsiveness) are reported by most parents of children with the age at diagnosis between 9 months and 2 years (26 parents, 20 boys and 6 girls), and the delay in language development is reported by the parents of the children with the age at diagnosis between 2 and 4 years (49 of the parents, 36 boys and 13 girls) (*Table 2*).

The lack of eye contact is a statistically significant early sign reported by the parents, it is reported in most children (16 parents out of 38, 12 boys and 4 girls) with age at diagnosis between 9 months and 2 years (*Table 3*).

Other statistically significant factors are hyperactivity and aggressivity, difficulties in social interaction and learning difficulties, although they were reported by most parents (22 patients, 5 and 2, respectively) in their child's 2-4 age range and 4-6 age (*Table 2 and 3*).

Lack of functional play and regression was reported by the parents in only 9 and 7 children, respectively, with age at diagnosis between 9 months and 2 years, but these factors are not statistically significant (*Table 2*).

The most common early signs for the age group 49-72 months were: delay in speech development, repetitive behaviours/movements, and difficulties in social interaction (*Table 2*). At this age, most social interactions occur, and deficits in verbal language and social behaviors are the easiest to identify.

For children with ASD older than 73 months, the most common early signs were deficits in understanding of orders, delayed language development, social interaction difficulties, and learning difficulties. The child goes to school and parents and teachers can see discrepancies between the typical development of a child and that of ASD.

There are statistically significant differences between boys and girls in terms of language delay and lack in sense game. In the case of boys, these signs were reported by the parents more often than in the case of girls (*Table 2* and *4*). Lack of eye contact, deficits in understanding of orders, and repetitive behaviour/movements were also reported by the parents more frequently in boys than in girls, but this difference was not statistically significant.

DISCUSSIONS

In our study the mean age of diagnosis of ASD was 30 months, comparing with the age of around 24 months reported by the majority of previous studies [16-18]. As the age interval of our study group was 9 months to 15 years, we would argue that the 30 months mean age of diagnosis in the lot was influenced by the higher ages of the few older patients that we included in the study. A meta-analysis of studies published between 2012-2019

Table 2
Frequencies of early signs in children with ASD depending on the age of diagnosis and their gender

Diagnostic age			Absent	Present	Total
			Delay in language development		
9-24 months	Gender	Boy	1	29	30
		Girl	2	6	8
		Total	3	35	38
25-48 months	Gender	Boy	0	36	36
		Girl	1	13	14
		Total	1	49	50
49-72 months	Gender	Boy	0	10	10
		Girl	0	1	1
		Total		11	11
≥73 months	Gender	Boy	1	0	1
		Total	1	0	1
Total	Gender	Boy	2	75	77
		Girl	3	20	23
		Total	5	95	100
			Non responsiveness		
9-24 months	Gender	Boy	10	20	30
		Girl	2	6	8
		Total	12	26	38
25-48 months	Gender	Boy	19	17	36
		Girl	9	5	14
		Total	28	22	50
49-72 months	Gender	Boy	9	1	10
		Girl	1	0	1
		Total	10	1	11
≥73 months	Gender	Boy	1	0	1
		Total	1	0	1
Total	Gender	Boy	39	38	77
		Girl	12	11	23
		Total	51	49	100
			Lack of sense game		
9-24 months	Gender	Boy	22	8	30
		Girl	7	1	8
		Total	29	9	38
25-48 months	Gender	Boy	27	9	36
		Girl	13	1	14
		Total	40	10	50
49-72 months	Gender	Boy	9	1	10
		Girl	1	0	1
		Total	10	1	11
≥73 months	Gender	Boy	1	0	1

Continues

Table 2
Continued

			Absent	Present	Total
		Total	1	0	1
Total	Gender	Boy	59	18	77
		Girl	21	2	23
		Total	80	20	100
			Stereotypes		
9-24 months	Gender	Boy	25	5	30
		Girl	7	1	8
		Total	32	6	38
25-48 months	Gender	Boy	29	7	36
		Girl	9	5	14
		Total	38	12	50
49-72 months	Gender	Boy	6	4	10
		Girl	0	1	1
		Total	6	5	11
≥73 months	Gender	Boy	1		1
		Total	1		1
Total	Gender	Boy	61	16	77
		Girl	16	7	23
		Total	77	23	100
			Lack of imitation		
9-24 months	Gender	Boy	28	2	30
		Girl	7	1	8
		Total	35	3	38
25-48 months	Gender	Boy	36	0	36
		Girl	14	0	14
		Total	50	0	50
49-72 months	Gender	Boy	10	0	10
		Girl	1	0	1
		Total	11	0	11
≥73 months	Gender	Boy	1	0	1
		Total	1	0	1
Total	Gender	Boy	75	2	77
		Girl	22	1	23
		Total	97	3	100
			Does not point the finger		
9-24 months	Gender	Boy	28	2	30
		Girl	6	2	8
		Total	34	4	38
25-48 months	Gender	Boy	35	1	36
		Girl	14	0	14
		Total	49	1	50
49-72 months	Gender	Boy	10	0	10

Continues

Table 2
Continued

					Total
		Girl	1	0	1
	Total		11	0	11
≥73 months	Gender	Boy	1	0	1
	Total		1	0	1
Total	Gender	Boy	74	3	77
		Girl	21	2	23
	Total		95	5	100

			Lack of eye contact		
			Absent	**Present**	**Total**
9-24 months	Gender	Boy	18	12	30
		Girl	4	4	8
	Total		22	16	38
25-48 months	Gender	Boy	25	11	36
		Girl	11	3	14
	Total		36	14	50
49-72 months	Gender	Boy	9	1	10
		Girl	1	0	1
	Total		10	1	11
≥73 months	Gender	Boy	1		1
	Total		1		1
Total	Gender	Boy	53	24	77
		Girl	16	7	23
	Total		69	31	100

			Hyperactivity and aggression		
			Absent	**Present**	**Total**
9-24 months	Gender	Boy	22	8	30
		Girl	7	1	8
	Total		29	9	38
25-48 months	Gender	Boy	21	15	36
		Girl	7	7	14
	Total		28	22	50
49-72 months	Gender	Boy	4	6	10
		Girl	1	0	1
	Total		5	6	11
≥73 months	Gender	Boy	1	0	1
	Total		1	0	1
Total	Gender	Boy	48	29	77
		Girl	15	8	23
	Total		63	37	100

			Regress in language		
			Absent	**Present**	**Total**
9-24 months	Gender	Boy	23	7	30
		Girl	8	0	8
	Total		31	7	38

Continues

Table 2
Continued

					Total
25-48 months	Gender	Boy	32	4	36
		Girl	14	0	14
	Total		46	4	50
49-72 months	Gender	Boy	8	2	10
		Girl	1	0	1
	Total		9	2	11
≥73 months	Gender	Boy	1	0	1
	Total		1	0	1
Total	Gender	Boy	64	13	77
		Girl	23	0	23
	Total		87	13	100

			Difficulties of social interaction		
			Absent	**Present**	**Total**
9-24 months	Gender	Boy	26	4	30
		Girl	6	2	8
	Total		32	6	38
25-48 months	Gender	Boy	31	5	36
		Girl	14	0	14
	Total		45	5	50
49-72 months	Gender	Boy	7	3	10
		Girl	0	1	1
	Total		7	4	11
≥73 months	Gender	Boy		1	1
	Total			1	1
Total	Gender	Boy	64	13	77
		Girl	20	3	23
	Total		84	16	100

			Learning difficulties		
			Absent	**Present**	**Total**
9-24 months	Gender	Boy	30	0	30
		Girl	8	0	8
	Total		38	0	38
25-48 months	Gender	Boy	36	0	36
		Girl	14	0	14
	Total		50	0	50
49-72 months	Gender	Boy	9	1	10
		Girl	1	0	1
	Total		10	1	11
≥73 months	Gender	Boy	0	1	1
	Total		0	1	1
Total	Gender	Boy	75	2	77
		Girl	23	0	23
	Total		98	2	100

ASD: Autism Spectrum Disorder.

Table 3

Fisher's Exact Test for the difference between the age categories diagnosed with ASD and the early signs

	Value	Exact Sig. (2-sided)
F delay in language development	8.654	0.031
F non-responssiveness	14.364	0.010
F lack of sense game	1.38	0.677
F stereotypes	4.49	0.191
F lack of imitation	5.66	0.162
F does not point of finger	4.31	0.234
F lack of eye contact	6.91	0.018
F hyperactivity and aggression	5.98	0.041
F regress in language	3.27	0.337
F difficulties in social interaction	8.25	0.025
F learning difficulties	13.15	0.002

Table 4

Mann-Whitney U test for differences between gender in terms of early signs

	W	df	p
Delay in language development	978.000		0.041
Non responsiveness	899.000		0.902
Lack of sense game	1015.500		0.033
Stereotypes	800.000		0.340
Lack of imitation	870.000		0.678
Does not point the finger	843.000		0.362
Lack of eye contact	892.000		0.951
Hyperactivity and aggression	911.000		0.807
Regress in language	NaN[a]		
Difficulties of social interaction	919.500		0.666
Learning difficulties	NaN[b]		

W: Mann-Whitney U test.
[a]The variance in regress in language is equal to 0 after grouping on gender.
[b]The variance in learning difficulties is equal to 0 after grouping on gender.

reports 60.48 months mean age at ASD diagnosis, with a range of 30.90-234.57 months, underlining the prioritization of early symptoms description and detection [19].

The most common concern expressed by caregivers at first presentation to the family doctor's office was represented by speech delay, followed by deficits in understanding instructions/indications, hyperactivity and aggressivity. More specific ASD signs such as lack of eye contact, repetitive behaviours/movements, and lack of functional play were reported by some parents at first presentation, however not as frequent as language development delays. These data are similar with some previous studies, which indicate that parents of children who had been subsequently diagnosed with ASD most frequently express concerns regarding language delay and communication difficulties [20-24]; however, the reported social interaction difficulties identified in other papers [20, 25, 26] were not expressed similarly frequent by the parents in our group. This brings to light the fact that, in certain cases, cardinal ASD symptoms such as social interaction deficits are overlooked by caregivers or even GPs, especially if more evident symptoms such as absent or delayed language are not present and thus the risk of delayed presentation to a specialized evaluation can occur.

Detecting early signs of autism in young children can be difficult. Some of these signs, such as slight delays in expressive language development, occasional repetitive movements or narrow symbolic play abilities can be observed in neurotypical children, as some developmental variations are physiological [27]. However, children with ASD express these behaviours more frequently and at higher intensities, with disruption of daily functionality.

Families' first contact with a specialist in childcare is the GP/paediatrician, these clinicians having a significant contribution to the child's progress and future prognosis, as they are the ones who subsequently refer patients to a specialized evaluation if they observe atypical features in their young patients. Our study's main purpose is to underline the fact that features such as the three most common concerns (speech delay, deficits in understanding instructions/indications, hyperactivity) that parents in our group expressed at first presentation at their family doctor's office, although not solely specific to ASD, should be taken into consideration in the GPs or paediatricians everyday clinical practice as an indicator for a possible neurodevelopmental disorder and thus the family should be directed to a specialized evaluation. Thus, if a diagnosis of ASD would be established, doing this sooner rather than later is of utmost importance for better prospects. Furthermore, as medical comorbidities are highly prevalent among children and adolescents with ASD, with 8-25% of these patients being diagnosed at some point in their lives, with a coexisting medical condition [28, 29], the presence of these comorbidities may delay, mask or complicate early diagnosis of ASD. Considering this, clinicians should keep in mind to check for ASD signs at regular visits, as well as when the child is brought for different somatic symptoms.

Early indicators of ASD are represented by: developmental deficits or delays in the areas of shared attention, symbolic play, affective behaviour, decrease/absence of name response, decrease/absence of imitative behaviour, verbal and nonverbal communication delay, motor development delay, repetitive behaviours, atypical sensory reactivity, inflexibility of visual attention and extreme variations of temper [30, 31]. At any age, the parents or caregivers should be concerned if they observe: loss of previously acquired skills, difficulties in maintaining eye contact, preference for spending time alone, persistent repetition of words or phrases (echolalia), difficulties in accepting minor changes in routine, restricted interests, repetitive behaviours/movements (hand-flapping, rocking back and forth, twirling), unusual and intense reactions to sounds, smells, tastes, textures, lights and/or colours [27, 30, 31]. However, in the group we analysed, these symptoms were not the ones which were the most reported

by parents at first presentation. As they were mainly concerned by expressive and receptive language difficulties, our study shows that these signs must not be ignored at usual check-ups in the GPs office and, if observed, the child should be directed to a mental health specialist for detailed evaluation. The reason why we want to stress this out is that in spite of intense scientific and public activity that involved ASD awareness and the development of ASD screening instruments, in our country, there is still a lot to be done in this area, as information does not seem to reach as many GPs and paediatricians as it should and ASD diagnosis is still delayed, as we observed in our study. One study that analysed the difficulties Romanian GPs have in identifying early signs of ASD was published by Rahbar *et al.* in 2021 and showed that although the physicians in their study group had basic information on ASD, a deficiency in knowledge about some aspects of ASD were identified as well and the authors indicate the need for "relevant supplementary educational activities" [32]. Our study could thus be a starting point of such educational activities, as it offers concrete evidence of what medical practitioners should pay attention to at routine check-ups, whether caregivers express concern or not, as subtle early ASD signs can be easily overlooked or considered part of normal development.

Previous studies do not point to a single behavioural sign or developmental trajectory that predicts all diagnostic forms of the autism spectrum. Given the heterogeneity of clinical expression of ASD, it is unlikely that a single behaviour will be found universally in all children or serve as a defining marker for later emerging ASD. Thus, assessment needs to be multidisciplinary, taking into account age-specific neurodevelopmental characteristics. According to the NICE Clinical Guideline, local autism teams led by a professional should be set up, in order to set the right strategy for the identification, evaluation and diagnosis of children with ASD, within 3 months after referral from the GP [33]. The SIGN Clinical Guideline underlines the importance of referral for professional assessment being done based on clinical characteristics identified in certain patients during child health monitoring, prioritizing this over screening instruments. At the same time, parents are encouraged to proceed for further evaluation if their concerns regarding their children's development are not properly addressed at routine health check-ups [34]. Available guidelines from The American Academy of Paediatrics, recommend that ASD screening with specific instruments be done in the GP/paediatrician's office at 6, 12, 18, 24 and 36 months of age [35]. Similar recommendations are available on a national level in Romania, where family doctors are indicated to make use of a screening instrument, developed under the National Programme for Early Identification of ASD, and evaluate children for possible autism signs at 12, 18, 24 and 36 months [36].

As per these recommendations by The American Academy of Pediatrics, GPs should use ASD screening tools habitually at primary care visits; however, recent studies have shown that these tools are infrequently used [31] and thus we underline the importance of the clinical evaluation and timely recognition of ASD symptoms by family doctors.

LIMITATIONS OF THE STUDY

We acknowledge that for this study the patient sample we selected might not be representative for all children diagnosed with ASD in Romania, as they were not randomly selected and, additionally, the sample size might not be considered significant. Instead, we collected data from patients who addressed our clinic in "Prof. Dr. Alexandru Obregia" Psychiatry Hospital, after referral from other services or by parents' choice. The results may also be influenced by the nonresponse bias for some questions. The data collecting method by clinical structures interview could have some limitations as well, taken into consideration the degree of subjectiveness of responders and the recall bias, as our study partially depended on caregiver-reported data.

CONCLUSION

ASD is a complex neurodevelopmental condition with an increasing frequency worldwide. The importance of the parents' expression of concerns regarding their children's development and the first and timely evaluation of these concerns in the GP'S office lies in the fact that early identification of possible ASD symptoms could lead to well-timed diagnosis and prompt intervention with better outcomes. Developmental symptoms described by the parents in our group at first presentation such as speech delay, deficits in understanding instructions/indications, hyperactivity should alarm the GP from the start as in some cases, although not specific to ASD, these symptoms could be early autistic traits. Our intention is to raise awareness among clinicians about the overlap of neurodevelopmental disorders-specific symptoms in early ages so that children that have such difficulties are directed to specialized evaluation. The need to raise awareness on this matter in our country raises from the fact that, although there are already numerous studies which describe ASD early signs recognition by caregivers, in Romania there are still GPs and/or pediatricians who don't consider symptoms such as language delay a significant developmental problem and thus refrain from recommending an evaluation by a mental health specialist and delay the confirmation of diagnoses such as ASD. We consider that a study on a Romanian group of children could have a greater informational impact and our results could be used to enrich training programs for family doctors or pediatricians for early recognition of ASD, such as their residency training during their rotations in mental health departments. Finally, as the medical and social burden associated with this diagnosis is constantly increasing, our aim is to contribute and act as starting point for future research in our country that should contribute to the development of comprehensive, multidisciplinary services, provided by general practitioners and pediatricians together with mental health specialists.

ORIGINAL ARTICLES AND REVIEWS

Authors' contributions

MB, FIL and LEA wrote the manuscript. MB, FIL, LEA, LM, AG, DI, and FR evaluated it; LM, AG, ID, ES, and FR contributed to acquisition, analysis, or interpretation of data; all Authors critically revised the manuscript for important intellectual content and approved the final version for submission.

Conflict of interest statement

The Authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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