Factors Associated With Age of Diagnosis Among Myanmar Children with Autism Spectrum Disorders

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Abstract

This study aimed to find out the average age of diagnosis, and factors associated with the age of diagnosis, among Myanmar children with Autism Spectrum Disorders. A cross-sectional descriptive study involving 84 children from two private special schools, namely New World and Light House. All children who were diagnosed as ASD, according to DSM-IV criteria, were involved in this study. Data was collected from the caregivers by face-to-face interviewing. Physical examinations and investigations were done as necessary. Results: A total of 84 children with ASD were included in this study. The mean age of diagnosis was 3.5 years old. The minimum age of diagnosis was 1 year old and the maximum was 6 years old. There were significant findings regarding factors associated with the age of diagnosis. A higher educational standard of the child's father, and some autism specific signs such as lack of pointing out objects of interest, and poor response to name being called, were associated with an earlier age of diagnosis of autism spectrum disorders. The presence of persistent preoccupation with parts of objects, the presence of selective eating habits and co-morbid conditions like epilepsy and global delay, had been found to delay the age of diagnosis of ASDs. This study revealed information regarding the age of diagnosis among Myanmar children with ASD, and factors associated with the age of diagnosis. Although this study could not represent the whole population, due to its limitation in sampling size and study area, the findings will contribute to future research being done in different places, including urban, as well as rural areas, with larger populations, which would result in a later age of diagnosis. Identified discrepancies in the age of diagnosis based on certain socio-demographic and clinical variables highlight the need for coordinated strategies for early detection of autism spectrum disorders.

Keywords : average age of diagnosis, Myanmar, factors associated with age of diagnosis.

Introduction

Autism is a lifelong neurodevelopmental disorder with a distinct pattern of social deficits, communication impairment, and rigid ritualistic interests. These symptoms often begin by the age of three years, and persist throughout the life span (American Psychiatric Association, 2000). A recent estimate of the current prevalence of autism spectrum disorders in Europe and North America is approximately 6 per 1000 (Fombonne, 2003). In 2007, Autism and Developmental Disabilities Monitoring Network of the Centers of Disease Control and Prevention reported ASD rates for 8-year-old children ranging from 1 in 303, to 1 in 94 for two time periods (2000 and 2002) in a total of

14 sites in the United States; the average rate was 1 in 150 or 6.6 per 1000 8-year-olds. Comparable figures, however, are unavailable for developing countries (Johnson, 2007). Autism spectrum disorders (ASD) are biologically based neurodevelopmental disorders that are highly inheritable but the exact cause is still unknown. ASD is diagnosed by clinical assessment, screening tools and exclusion of other causes of speech delay and communication problems. The Diagnostic and Statistical Manual of Mental Disorders: Fourth Edition (DSM-IV) criteria is a commonly used diagnostic criteria for ASD. Timely diagnosis, as early in life as possible, is critical for enrollment in intervention services, in order to capitalize on neuroplasticity. Rogers and Vismara (2008) also suggested that children who begin treatment at an earlier age have better outcomes than those who initiate treatment later. Moreover, the symptoms of autism and associated behaviors can be bewildering and frustrating to parents, and therefore, timely and appropriate diagnosis can result in better understanding and coping (Shattuck and Grosse, 2007). Estimates of the average age of diagnosis in ASD vary, ranging from 3.9 to 5.7 years depending on research design (Mandell et al, 2010). A subgroup of ASD has been associated with the age of diagnosis in several studies. Children with autistic disorder (AD) received diagnosis at an average age of 3.1 years old, followed by children with pervasive developmental disorder- not otherwise specified (PDD-NOS) (3.9 years old) and children with Asperger's disorder (7.2 years) (Mandell, Novak, & Cynthia, 2005). Shattuck et al (2009) described that factors such as increased rurality and lower community affluence have been associated with delay in the age of diagnosis. At the family level, higher parental education is associated with an earlier age of diagnosis and an increased likelihood of diagnosis (Rosenberg, Landa, Law, Stuart, & Law, 2011). Patient factors such as presence of certain symptoms (e.g. severe language deficit, odd play and hand flapping) are also predictive of age at diagnosis (Mandell, Novak, & Cynthia, 2005).

Objectives

This study will try to find out the average age of diagnosis and the factors associated with the age of diagnosis among children with autism spectrum disorders and intend to give information regarding awareness of autism, aiming to lower the age at which autism is detected.

Methods

Participants This study was a cross-sectional descriptive study done in two private special schools, namely New World and Light House, from January 2014 to December 2014. All children who were diagnosed as ASD, according to DSM-IV criteria, were involved in this study. Both newly diagnosed cases and old cases attending therapeutic training schools were involved in this study, and those whose parents did not give consent to be involved in this study were excluded.

Measures

Consents were obtained from parents or caregivers, and school officials. New cases of children with ASD were seen by the researcher in the presence of a consultant pediatrician (Neurology), and relevant history taking, a physical examination and screening by the tool Gilliam Autism Rating Scale (GARS) were carried out. New cases were diagnosed according to DSM IV criteria. In the instance of previously diagnosed cases, the researcher reviewed their records, while relevant history taking, a physical examination and investigations were done as necessary. History focused on features of ASD, parental concerns, age of diagnosis, and factors associated with age of diagnosis such as described in pro-forma by face to face interview. The patient examination emphasized autism specific signs and other comorbid

conditions.

Data analysis

The coding in the questionnaire forms were checked and entered into the computer using Microsoft Excel. Data processing and statistical analysis were done using SPSS version 16. For descriptions of data, frequency tables, bar graphs and pie charts were constructed. Factors associated with the age of diagnosis were analyzed using a Chi-square test.

Operational Definitions

Attention Deficit Hyperactivity Disorder (ADHD) is defined according to DSM-IV. It is characterized by: (1) inattention, including increased distractibility and difficulty sustaining attention; (2) poor impulse control and decreased self-inhibitory capacity; and (3) motor over-activity and motor restlessness.

Autism Spectrum Disorders – is defined according to DSM-IV.

DSM-IV Diagnostic Criteria for ASD

A. A total of six (or more) items from (1), (2), and (3) with at least two from (1) and one each from (2) and (3);

(1) qualitative impairment in social interaction, as manifested by at least two of the following:
   (a) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye contact, facial expression, body postures, and gestures to regulate social interaction
   (b) failure to develop peer relationships appropriate to developmental level
   (c) lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. by lack of showing, bringing, or pointing out objects of interest)
   (d) lack of social and emotional reciprocity

(2) qualitative impairment in communication as manifested by at least one of the following:
   (a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
   (b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
   (c) stereotyped and repetitive use of language or idiosyncratic language
   (d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

(3) restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following:
   (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
   (b) apparently inflexible adherence to specific, non-functional routines or rituals
   (c) stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole-body movements)
   (d) persistent preoccupation with parts of objects

B. Delayed abnormal functioning in at least one of the following areas, with onset before 3 years old;

(1) social interaction
(2) language as used in social communication, or
(3) symbolic or imaginative play

C. Disturbances not better accounted for by Rett's disorder or childhood disintegrative disorder.

Behavioural problem is defined as hyperactivity, or aggressiveness, or crying which is inconsistent with the child's current developmental level and significantly impairs family, social or school functioning.

Epilepsy is defined according to the International League Against Epilepsy as at least

two unprovoked seizures.

Global developmental delay is defined as a significant delay in two or more of the following developmental domains: gross or fine motor, speech and language, social and interpersonal, and activities of daily living.

Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) is defined as presence of other ASD features, but insufficient for a specific diagnosis of autism.

Special School is defined as a school for training children with special needs.

Speech delay is defined as no meaningful words by the age of 18 months or loss of language skills at any age.

Ethical Consideration

This study is ethical from the point of consideration of human research for the following reasons:

(1) Informed consent of the parents or guardians was obtained after thorough explanation of the study. New investigations and new treatments were not included in this study. The parents or guardians had the right to withdraw from the study at any time.
(2) Confidentiality of the information collected was strictly maintained.
(3) The results of the study were only used for health care and research purposes.

Results

The majority (66.7%) of studied children were diagnosed between 3 - 5 years of age. The remainder were diagnosed under 3 years (28.6%) and over 5 years of age (4.8%). The mean age of diagnosis was 3.5 years and the standard deviation was 1.1 years. The minimum age was 1 year and the maximum age was 6 years. The majority of children in this study were under 12 years of age (81%) while the minority were 12 years and above (19%). The minimum age was 2 years 6 months and the maximum age was 19 years. There was male preponderance with 83.3% males and 16.7% females. The male to female ratio was 5:1. 60% of the study children were first born and 40% were not. Most of the children (95.2%) live in Yangon and only 4.8% of them are from district townships. The majority (86.9%) of mothers were graduates, 11.9% were undergraduates, and only 1.2% were postgraduates. The majority (78.6%) of fathers were graduates, 17.9% were undergraduates and only 3.6% were post-graduates. Problems of first concern were speech delay (50%), global delay (3.6%), behavioural problems (33.3%), poor eye contact (11.9%) and others (1.2%), among which speech delay was the main problem. The most common age at the first medical consultation was 1-3 year olds (59.5%) followed by over 3- 5 year olds (33.3%), over 5 year olds (6%) and less than 1 year old (1.2%). Main problems at the first medical consultation were speech delay (64.3%), followed by behavioural problems (21.4%), poor eye contact (8.3%), global delay (4.8%) and others (1.2%). Most of the patients (54.8%) consulted with 1-2 primary care physicians before getting a diagnosis, 25% consulted with 3 or more primary care physicians, and the rest were diagnosed directly. Most of the patients (86.9%) first consulted with a pediatrician, 6% with a psychiatrist and 7.1% with a general practitioner. Most children were diagnosed as autistic by a pediatrician (97.6%) and the remainder by psychiatrists (2.4%).

In this study, most of the patients (94%) had delayed speech and was the most common symptom in this study. Poor peer relationships appropriate to age was one of the common signs and it was present in 85.7% of the study children. Out of 84 study children, 65.5% of them had loss of language or social skills and 63 (75%) had idiosyncratic speech. Poor eye contact and lack of pointing out objects of interest were present in over 91% of the study children. Among the study children, 64.3% had picky eating, 46.4% had poor

sleep during night-time, 63.1% had hyperactive play and persistent preoccupation with parts of objects, and 78.6% had poor response although hearing was intact.

Table 1 shows the frequency distribution of age of diagnosis for various factors using the Chi-square method. Among the various factors, the education standard of the father had a significant association with the age of diagnosis, showing a higher level of paternal education was associated with a younger age of diagnosis and the P-value was 0.009. The presence of certain symptoms also had a statistically significant association with the age of diagnosis. There was a significant association between the earlier diagnosed age group and the later diagnosed age group in having some symptoms, such as poor response to sound, and lack of pointing out an object of interest, showing larger distribution in the earlier diagnosed age group. Food selectivity was more common in the later diagnosed age group (75.6%) compared with the earlier diagnosed age group (53.5%), and it had significant association with the age of diagnosis of ASD. Among the study children, 51.2% of the earlier diagnosed age group and 75.6% of the later diagnosed age group had persistent preoccupation with parts of objects and there was significant difference between the two study age groups revealing that the later diagnosed age group had a larger number of patients with this behaviour. The presence of co-morbid conditions, such as epilepsy and global developmental delay, also had significant association between the two age groups, revealing that a larger percentage were found in the later diagnosed age group.

Discussion

Average age of diagnosis of autism spectrum disorders

In this study, the majority (66.7%) of the studied children were diagnosed between 3 and 5 years of age. The remainder were diagnosed under 3 years (28.6%) and over 5 years of age (4.8%). The mean age of diagnosis was 3.5 years and the standard deviation was 1.1 years. The minimum age was 1 year and the maximum age was 6 years. This finding was similar to the findings of the Khin-Lei-Lei-Shein study conducted in 2011 in which most of the study children (64.63%) were diagnosed between 3-5 years of age and the remainder were diagnosed under 3 years (24.39%) and at the age of 6 years old (10.98%). Shattuck et al (2009) found that the median age of diagnosis was 5.7 years old, by using the data from 13 sites of the Autism and Developmental Disabilities Monitoring Network in the United States. Howlin & Moore (1997) also found that the average age of diagnosis was 6.11 years old by using samples from 1295 families in the U.K. A study by Mandell, Novak, & Cynthia (2005), conducted in Pennsylvannia, U.S.A. in 2005 revealed that the average age of diagnosis differed with the spectrum of ASD. They found that children with autistic disorder received diagnosis at 3.1 years old, children with PDD-NOS at 3.9 years old, and children with Asperger's Disorder at 7.2 years old. In a Canadian sample, Siklos & Kerns (2007) found the average age of diagnosis was 5 years old. In another study in Canada conducted in (2011) by Frenette et al., 2011, the median age of diagnosis was 4.6 years. It is possible that the average age of diagnosis for this present study was younger because most (95.3%) of the children involved were under 5 years of age. Furthermore, the sample size was small and only represented the data from two special schools, namely New World and Light House, showing that most of the children were from urban areas. The average age of diagnosis may become later if further study could be carried out at community level including rural areas, where most of the patients were undiagnosed, due to lack of awareness of autism.

Table 1: Frequency distribution and age of diagnosis for various factors

	Total No	P-value	Early Age of diagnosis < 3.11 year		Later Age of diagnosis > 3.11 year	
			Frequency	%	Frequency	%
Sex		0.283				
Male	70		34	79.1%	36	87.8%
Female	14		9	20.9%	5	12.2%
Birth order		0.621				
First born	51		25	58.1%	26	63.4%
Not first born	33		18	41.9%	15	36.6%
Residence		0.257				
Urban	74		40	97.6%	34	91.9%
Rural	4		1	2.4%	3	8.1%
Educational Status of father		**0.009**				
Undergrad	15		3	7%	12	29.3%
Graduate	66		37	86%	29	70.7%
Postgrad	3		3	7%	0	0.00%
Educational status of Mother		0.073				
Undergrad	10		2	4.7%	8	19.5%
Graduate	73		40	93%	33	80.5%
Postgrad	1		1	2.3%	0	0.00%
Problem of first concern		0.275				
Speech delay	42		20	46.5%	22	53.7%
Global delay	3		1	2.3%	2	4.9%
Behavioural problem	28		13	30.2%	15	36.6%
Poor eye contact	10		8	18.6%	2	4.9%
Other	1		1	2.3%	0	0.00%
Problem of first consultation		0.158				
Speech delay	54		28	65.1%	26	63.4%
Global delay	4		2	4.7%	2	4.9%
Behavioural problem	18		6	14%	12	29.3%
Poor eye contact	7		6	14%	1	2.4%
Other	1		1	2.3%	0	0.00%
Doctor of first consultation		0.871				
Pediatrician	73		38	88.4%	35	85.4%
Psychiatrist	5		2	4.7%	3	7.3%
Other	6		3	7%	3	7.3%

	Total No	P-value	Early Age of diagnosis < 3.11 year		Later Age of diagnosis > 3.11 year	
			Frequency	%	Frequency	%
No. of primary care physician before diagnosis		**0.008**				
0	17		13	30.2%	4	9.8%
1	29		15	34.9%	14	34.1%
2	17		3	7%	14	34.1%
3	16		8	18.6%	8	19.5%
4	5		4	9.3%	1	2.4%
Diagnosis given by whom		0.973				
Pediatrician	82		42	97.7%	40	97.6%
Psychiatrist	2		1	2.3%	1	2.4%
Autism specific signs and symptoms						
Poor sleep during night time	39	0.39	18	41.9%	21	51.2%
Hyperactive play	53	0.062	23	53.5%	30	73.2%
Persistent preoccupation with parts of objects	53	**0.02**	22	51.2%	31	75.6%
Food selectivity	54	**0.034**	23	53.5%	31	75.6%
Loss of language or social skill	55	0.596	27	62.8%	28	68.3%
Idiosyncratic speech	63	0.101	29	67.4%	34	82.9%
Poor response although hearing is intact	66	**0.006**	39	90.7%	27	65.9%
Poor peer relationships appropriate to age	72	0.593	36	83.7%	36	87.8%
Poor eye contact	77	0.211	41	95.3%	36	87.8%
Lack of pointing out object of interest	77	**0.041**	42	97.7%	35	85.4%
Delayed speech	79	0.606	41	95.3%	38	92.7%
Co-morbid condition						
Epilepsy	7	**0.005**	0	0.00%	7	17.1%
Global developmental delay	27	**0.024**	9	20.9%	18	43.9%
Sleep problem	30	0.283	13	30.2%	17	41.5%
Family history of autism	11	0.291	4	9.3%	7	17.1%

Factors associated with age of diagnosis of autism spectrum disorders

Sex difference In this study, there was male preponderance with 83.3% males and 16.7% females. The male to female ratio was 5:1 which is comparable to the sex ratio of 3-4:1 in literature (Bryson & Smith, 1998; Ouellette-Kuntz et al, 2006). The sex of the child had no significant association with the age of diagnosis, and this is consistent with the findings from previous studies (Shattuck et al,2009; Mandell, Novak & Cynthia, 2005; Wiggins, Baio & Rice, 2006).

Birth order In the present study, the majority of children were first born (60.7%) and the minority were not (39.3%). There was no relationship between the birth order and age of diagnosis of ASD in this study. This finding is similar to that of a previous study (Frenette et al., 2011).

Educational status of the parents In the current study, 73 mothers (86.9%) were university graduates, 10 (11.9%) were undergraduates, and only one (1.2%) was a postgraduate. Therefore the majority of mothers of study children were educated. Ninety-three percent of mothers of the early diagnosed group, and 80.5% of mothers of the later diagnosed group were graduates, and there was no significant association between age at diagnosis and educational status of the mother. This finding contradicted previous studies (Baghadadi et al, 2003; De Giacomo & Fombonne, 1998; Rosenberg et al, 2011). Regarding the educational status of the fathers, the majority (78.6%) of fathers were graduates, (17.9%) were under-graduates, and only (3.6%) were post-graduates. Therefore, the majority of fathers were educated. Most of the previous studies did not include the educational status of the father as an associated factor. In this study, the educational status of the father has significant association with the age of diagnosis of autism and this may be related to the factor that most fathers in Myanmar were family breadwinners and they may have some influence in seeking earlier health care services.

Problems of first concern According to this study's findings, problems of first concern were speech delay (50%), global delay (3.6%), behavioural problems (33.3%), poor eye contact (11.9%) and others (1.2%), with speech delay being the main problem. These findings were consistent with other studies (Debra Barrie, 2010; Khin-Lei-Lei-Shein, 2012; Howlin & Moore; 1997, Chakrabarti, 2009; and Young, Brewer & Pattison, 2003), where speech and language delay were the first concerns of most parents. However, there was no significant association between age at diagnosis and problem at first concern.

Problems of first consultation Similar to problems of first concern, speech delay, global delay, behavioural problems, poor eye contact and others were categorized as problems of first consultation. Among them, speech delay was the most common problem of first consultation (64.3%), which was followed by behavioural problems (21.4%), poor eye contact (8.3%), global delay (4.8%) and others (1.2%) respectively. While patients often presented with a combination of symptoms, on the whole, the most common reason for referral was communication impairment (Al-Salehi, Al-Hifthy, & Ghaziuddin, 2009). However, no significant difference was found between the earlier diagnosed age group and the later diagnosed age group regarding the problems of first consultation.

Doctors at first consultation In this study, most of the patients (86.9%) first consulted with a pediatrician, 6% with a psychiatrist and 7.1% with a general practitioner. No significant differences were found between the early diagnosed group and the later

diagnosed group regarding whether they first consulted with pediatricians, psychiatrists or general practitioners. This finding was consistent with the previous study done by Debra Barrie in 2010.

Number of primary care physicians before diagnosis In the present study, most of the patients (54.8%) consulted with 1-2 primary care physicians before getting a diagnosis, 25% consulted with 3 or more primary care physicians, and the rest were diagnosed directly. This study found that 34.9% of the early diagnosed group and 56% of the later diagnosed group saw two or more primary care physicians before getting a diagnosis, and there was significant association between the age at diagnosis and the number of primary care physicians seen before diagnosis. Therefore, the greater the number of primary care physicians that were seen at a later age at diagnosis. This finding was consistent with a previous study by Mandell, Novak, & Cynthia (2005), .Seeing many primary care physicians before diagnosis may be related to issues such as parents not recognizing the importance of continuous pediatric care or alternatively, switching physicians may be the result of families' frustration that their concerns are not being acknowledged or addressed.

Person who gave the diagnosis According to the study findings, most children were diagnosed as autistic by a pediatrician (97.6%) and the remainder by a psychiatrist (2.4%). No significant differences were found between the earlier diagnosed group and the later diagnosed group, in regard to whether they diagnosed by a pediatrician or a psychiatrist.

Autism specific signs and symptoms The presence of some symptoms seemed to trigger earlier diagnosis. In the study by (Mandell, Novak, & Cynthia (2005), they found that children with severe language deficits received a diagnosis, on average, of 1.2 years earlier than other children. In this study, most of the patients (94%) had delayed speech, however it had no significant association with the age of diagnosis of autism. Among the study children, 62.8% of the earlier diagnosed group, and 68.3% of the later diagnosed group had regression in language skills. The frequency distribution was similar between the two groups and therefore there was no significant association between the age at diagnosis and the loss of language skill in this study. In this study, presence of idiosyncratic speech had no significant association with the age of diagnosis of autism, although findings showed that a larger percentage was found in the later diagnosed group (82.9%) compared with (67.4%) in the earlier diagnosed group.

According to previous studies (Landa, Holman & Garrett-Mayer, 2007; Robins, Fein & Barton, 2001; Young, Brewer & Pattison, 2003; Josephine & Cheryl, 2012), poor eye contact and lack of pointing had been found to be the important markers for the identification of ASD between 12 to 24 months of age. In this study, 77 out of 84 children (91.7%) had poor eye contact and lack of pointing. There was significant difference between the earlier diagnosed age group and the later diagnosed age group in having a lack of pointing, revealing that presence of this sign was associated with an earlier age of diagnosis.

In this study, 54 out of 84 children (64.3%) had picky eating and this finding is comparable with the finding from the study by William et al (2007), in which 100 parents of children with ASDs aged 22 months to 10 years were surveyed, from which 67% of the parents reported that their child had selective eating habits. Food selectivity was more common in the later diagnosed age group (75.6%) compared with the earlier diagnosed age group (53.5%) and it had significant association

with the age of diagnosis of ASD. This study found that 72 out of 84 children (85.7%) had poor peer relationships appropriate to their age, among which 36 were diagnosed as ASD before 3.11 years old, while the same number of children were diagnosed as ASD ≥ 3.11 year. The distribution was similar between the two groups and there was no significant association between presence of poor peer relationships appropriate to age and age of diagnosis. Only 46% of studied children had poor sleep during nighttime and it had no significant association with the age of diagnosis of autism. In this study, 63.1% had hyperactive play and the later diagnosed age group contributed to the larger percentage. However, there was no statistically significant difference between the later diagnosed age group and the earlier diagnosed age group. Among study children, 51.2% of the earlier diagnosed age group and 75.6% of the later diagnosed age group had persistent preoccupation with parts of objects and there was significant difference between the two study age groups revealing that the later diagnosed age group had a larger number of patients with this behaviour. In this study, 66 out of 84 children had poor response to name being called, although hearing was intact. Among them, 90.7% were from the earlier diagnosed age group and only 65.9% were from the later diagnosed age group and there was significant difference between the two age groups in having this behaviour. Thus, as described by previous studies (Adrien et al., 1993; Nadig et al., 2007; Watson et al, 2007), being deficit in response to name being called was an important marker for early identification of autism spectrum disorders.

Co-morbid conditions In this study, co-morbid conditions such as epilepsy, global delay and sleep problem were taken as factors associated with the age of diagnosis and the association between them was calculated by using the Chi-Square method. There was significant difference between the earlier diagnosed age group and the later diagnosed age group in having epilepsy as a co-morbid condition, showing that children with epilepsy were diagnosed later. This could be explained by the fact that the presence of epilepsy prompts the clinician to be occupied with the management of epilepsy, delaying the diagnosis of autism spectrum disorders. This study also found that the presence of global delay had a significant association with the later age of diagnosis. This may be due to the fact that global delay itself was associated with speech delay, secondary autistic signs and that these children are also difficult to assess properly. Both parents and physicians might have been paying attention to other more important problems than autism. Therefore, this would hinder the proper assessment for diagnosis of autism spectrum disorders.

Family History of Autism According to this study, 11 out of 84 children (13.1%) had a family history of autism and there was no statistically significant association between the age of diagnosis and family history of autism. Therefore, familiarity in the signs and symptoms of autism resulting in earlier diagnosis was not supported by this study.

Limitation of this study

In this study, the sample size was only 84 participants and all were from special training schools. Therefore, this study evidently had a selection bias. Ideally, it should be carried out in different places including urban and rural areas with larger populations, so that; it would represent the population from different levels of socioeconomic status as well as different levels of educational standards. Moreover, this study was only a cross-sectional descriptive study and therefore it did not cover the long term follow up period, during which, the outcome of early diagnosis of ASD and early intensive behavioural therapy could be observed.

Conclusion

This study revealed information regarding the age of diagnosis among Myanmar children with ASD and factors associated with the age of diagnosis. Although this study could not represent the whole population, due to its limitation in sampling size and study area, the findings will contribute to future research done in different places, including urban as well as rural areas with larger populations, which would result in later age of diagnosis. Identified discrepancies in the age of diagnosis based on certain socio-demographic and clinical variables highlight the need for coordinated strategies for early detection of autism spectrum disorders.

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