Pre-schoolers Referred to a Child and Adolescent Mental Health Clinic: A Hospital Quality Improvement Report

Irene B Elgen[1,2] (iD), Mariell Stikholmen[2], Rolf Gjestad[1], Inger Lande Danielsen[1] and Silje Fevang[2]

[1]Department of Child and Adolescent Psychiatry, Division of Psychiatry, Haukeland University Hospital, Bergen, Norway. [2]Department of Clinical Medicine, University of Bergen, Bergen, Norway.

ABSTRACT

OBJECTIVE: Aim of the study was to evaluate the patient pathway from referral to assessment and diagnosis of pre-schoolers referred to a Child and Adolescent Mental Health Clinic (CAMHC) in Norway.

METHOD: Following data were collected retrospectively from medical records over a 2-year study period: data from clinical interviews for diagnostic evaluation, observation findings in kindergartens and the CAMHC, and results from medical examinations. The times taken from referral to first contact with the CAMHC, then to the first evaluation, and finally to diagnosis were assessed.

RESULTS: Of 13402 pre-schoolers, 88 (0.7%) were referred to the CAMHC, of which 15 refused assessment and 69 completed a diagnostic assessment. Of the assessed children, 15 (21%) did not meet any criteria for an *International Classification of Diseases, Tenth revision* (*ICD-10*) diagnosis, 26 (38%) were diagnosed with developmental disorders, and 10 (14%) were given a non-specific diagnosis. For those children without a specific diagnosis, the mean time taken from referral to CAMHC assessment and diagnosis was longer, although not statistically significant, compared with those with a specific diagnosis ($P = .52$). No significant correlation between referral symptoms and final diagnosis was found.

CONCLUSIONS: Pre-schoolers referred to the CAMHC have an increased risk of having developmental disorders. Furthermore, 1 in 5 of the children had comorbidities. We propose more effective health care service by developing an interdisciplinary approach for the management of these children.

KEYWORDS: Development, mental health, health services, developmental disabilities

Introduction

Early identification of developmental disorder (DD) is of considerable importance.[1] However, the complex nature of DD and the presence of comorbidities may make their identification difficult in early childhood due to several factors such as presentation of symptoms, inherent high risk for delays in the diagnostic process, incomplete or inaccurate diagnoses, and inadequate or insufficiently coordinated management plans.[1-3]

A previous study showed that children with chronic illness are at increased risk of psychiatric disorders.[4] Population-based studies also found an increased prevalence of mental health disorders in children with epilepsy[5] and cerebral palsy.[6] These reports raise the question of whether effective integrated health services, including, eg, primary care, hospital services are needed for improved health outcomes in population of children, eg, with delayed development and chronic illnesses.[1,7]

In primary care, the complexity of the condition may cause uncertainty among general practitioners regarding when and where to make a referral and which other relevant appropriate measures to take. This uncertainty is compounded also by the fact that different psychiatric disorders can present with similar symptoms.[1]

Nowadays, children with DDs are often referred to different specialties in secondary care, including paediatrics, rehabilitation services, and child psychiatry. Individual symptoms considered in isolation in children with DDs may not necessarily justify a particular diagnosis or may result in an inadequate or incorrect diagnosis, despite significant impairment in social and mental function. Moreover, fragmented assessments rarely bring answers or solutions to these children's conditions and challenges, and their management and care may not be appropriately coordinated. Importantly, managing such complex cases is time-consuming and expensive, not only for the children and their parents or guardians, but also for resource- and budget-constrained health care systems and society at large.[2,3,8] As a potential solution towards efficient and coordinated management, at least of children with certain chronic illnesses, recommendations have been put forward using a framework based on child- and family-centred care.[2,7]

In this study, we report on pre-schoolers regarding referral symptoms and possible final diagnostic conclusion in a Child and Adolescent Mental Health Clinic (CAMHC) in Norway.

Materials and Methods

Population

This study included children who had been referred to a CAMHC in Bergen, Hordaland County, Norway over a 2-year period (2014-2016). The total number of preschool children in this area aged 0 to 6 years in the 2 years was 13 402. Demographic characteristics of the study population, including average parental income, education, and proportion of urban versus rural residence, were comparable to those from other parts of Norway. The following data were collected retrospectively from the children's medical records.

Referral symptoms

Children referred to CAMHC have to be categorized by the referral instance in one of the following symptom categories: behavioural problems, attention-deficit/hyperactivity disorder (ADHD) symptoms, autism spectrum disorder (ASD) symptoms, language difficulties, and mood problems (anxiety, depression). These referral symptoms were obtained and included in the study.

Diagnostic assessment

Standard clinical assessment of pre-schoolers at the CAMHC was performed, based on the World Health Organization's classification system: *International Classification of Diseases, Tenth revision* (*ICD-10*) criteria,[9] by a team including a psychologist, a pedagogue, a social worker, and a child and adolescent psychiatrist. The ICD-10 is an international statistical classification of diseases and related health problems used in European countries. When assessing mental health issues, chapter V 'Mental and behavioural disorders' is used. First, a clinical interview was conducted in the presence of the children's parents or guardians, and all children's behaviour was also observed in their kindergarten as well as in clinic. In addition, the children underwent a medical assessment. By considering all these evaluation findings put together, the assessing team determined whether the children fulfilled the criteria for a particular ICD-10 diagnosis. Next, the need for further diagnostic assessments was evaluated. Finally, for those children who needed further diagnostic assessments, the preschool team summarized the assessment findings and the child was categorized as either with or without a diagnosis. The diagnostic summary (post-CAMHC assessment) was collected from the patient record.

Cognitive functioning

Intelligence test was assessed using the Wechsler Preschool and Primary Scale of Intelligence, third edition (WPPSI-III)

test. Of 43 children who undertook the WPPSI-III test, 41 completed the test. The mean intelligence quotient (IQ) was 85 (SD = 13). Three of the 41 children with an IQ of below 70 were found to meet the criteria for mental retardation (F70'), following evaluation of their adaptive functioning using the Adaptive Behavior Assessment System, second edition (ABAS-II).

Attention-deficit/hyperactivity disorder

Symptoms of hyperactivity problems and inattention were assessed using RA Barkley's Disruptive Behavior Disorders Rating Scale-Parent Form,[10] Disruptive Behavior Disorders Rating Scale-Teacher Form,[11] and Clinical Interview-Parent Report Form.[12] A clinical interview was conducted to confirm a diagnosis of ADHD, according to ICD-10.

Autism spectrum disorder

The Autism Spectrum Screening Questionnaire (ASSQ) is a 27-item screening questionnaire designed to identify school-aged children displaying autism spectrum symptoms for whom a comprehensive evaluation of suspected ASD would be indicated. The ASSQ was previously validated in a Norwegian childhood population.[13] For this study, cut-off scores derived from the validation study defined at the 98th percentile and corresponding to cut-off scores of ≥17 were used.[13] Children scoring above 17 were further assessed using the Autism Diagnostic Observation Schedule (ADOS) and Autism Diagnostic Interview, Revised (ADI-R), both tools used to exclude ASD. Of 10 children with a high ASSQ score 5 were given a diagnosis of ASD (F84').

Language assessment

Language assessment was performed by a primary preschool team outside the CAMHC. In collaboration with primary preschool team and CAMHC, the children were given different diagnoses. Of the 28 children assessed, 18 met the criteria for a receptive language disorder (F80.2). Of the remaining 10 children who did not meet these criteria, 5 were subsequently given an F84 diagnosis, and 5 an R-diagnosis, at the CAMHC.

Medical assessment

A clinical examination was assessed and all children underwent blood test with hematogram, status of liver, and kidney in addition to vitamin B12 and vitamin D status. For 4 children, suspected dysfacial traits genetic test was performed and 3 had chromosome disorder (3/4). Further when indicated after clinical examination, electroencephalography was assessed for 6 children and 4 were confirmed with epilepsy. One child was diagnosed with asthma during the assessment with the child psychiatrist.

Patient pathway

The patient pathway was divided into 3 phases: (1) time taken from the CAMHC receiving application to the first meeting with the family, (2) time taken to the first assessment, and (3) time taken to reach a final diagnosis.

Statistical Analyses

Most of the data were descriptive. For the mean time taken for diagnostic assessment, descriptive analyses were used to describe the sample in terms of the mean and SD. Group differences were analysed using the *t* test. To explore possible predictors of the time needed for diagnostic evaluation, a linear regression analysis was performed, with time taken for baseline evaluation as the dependent variable and age at referral, sex, referral symptoms, presence of a specific diagnosis, and presence of a somatic disorder as independent variables. SPSS statistical package version 23 was used for all analyses.

Ethics

We have consulted the data protection officer at the hospital, hence no need of application at the Regional Committee for Medical Research Ethics.

Results

Of the total of 13 402 pre-schoolers over the 2-year study period, 88 (0.7%) were referred to the CAMHC. Of these, 73 (83%) children were included, 4 (5%) did not complete the assessments. Almost 3 in 4 of the children were boys (51/69; 74%), and the mean age was 56 months (SD = 14 months).

Regarding the 15 (17%) being refused assessment, mean age was comparable with the included and 2 reasons for refusal were either lack of symptoms reported or missing parents' confirmation.

Referral symptoms

Most of the referrals originated from primary care (ie, family physicians) (62/69, 90%), with the remaining referrals coming from social welfare (4/69, 6%) and paediatric departments (3/69, 4%). The 3 main referral complaints or symptoms were inattention-impulsivity-hyperactivity, autism, and behavioural problems.

Diagnostic profile

The diagnostic profile for the 69 children completing the diagnostic assessments is shown in Table 1.

Of these 69 children, 15 (22%) did not meet the criteria for an ICD-10 diagnosis. Ten of the 36 (28%) children with an Axis I diagnosis had a diagnosis 'Lack of expected normal physiological development' (Table 2). These 10 children presented with symptoms of delayed development not yet classified. Of the 69 referred children 26 (38%) had a DD with a

Table 1. Number of pre-schoolers referred to a Norwegian CAMHC[a] with or without diagnoses, according to ICD-10 axes[b] (N = 69).
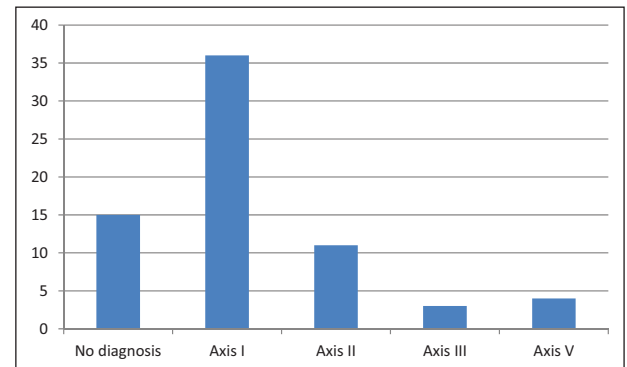
[a]CAMHC: Child and Adolescent Mental Health Clinic.
[b]ICD-10 comprises 6 axes, but only Axes I, II, III, and IV are presented here.

Table 2. Diagnostic profile of 69 pre-schoolers referred to the CAMHC.[a]

AXIS I	AXIS II	AXIS III	AXIS IV	AXIS V
F40' (n = 2)	—	—	—	—
F84 (n = 5)	—	—	1 (G40.3)	—
F90 (n = 10)	4	—	3 (Q95.2) 2 (G40.9)	—
F93 (n = 2)	1	—	—	—
F94 (n = 5)	1	—	—	—
F98' (n = 2)	1	—	—	—
R62 (n = 10)	—	—	—	—
None in Axis I (n = 15)	11	3	1 (G40.3)[b] 2 (H91.9)[b] 1 (J45)[b]	1
None in Axis I-IV (n = 3)	—	—	—	3
Total[c] (n = 54)	18 (11[c] + 7)	3[c]	10	4[c] (3 + 1)

Abbreviation: CAMHC, Child and Adolescent Mental Health Clinic.
[a]A total of 54 children were diagnosed according to the ICD-10 classification (Axes I-V).
[b]All 4 children had Axis II diagnosis.
[c]Total number for the 5 axes = 54 (36 Axis I + 11 Axis II + 3 Axis III + 4 Axis V).

diagnosis including children with ADHD (Table 2). Among the 11 children with an Axis II diagnosis, the most common DD was a receptive language disorder.

Moreover, medical assessment of the referred children revealed 10 children with a medical diagnosis, including 4 cases (6%) of epilepsy (Table 2). Of the 10 children with ADHD, 7 (70%) had at least 1 comorbidity, including learning disabilities or a medical condition.

Of the 4 children with an Axis V diagnosis, 3 had a probable social environmental factor as the only explanation to their symptoms (Table 2). However, no referral symptoms were

Table 3. Correlation between referral symptoms and final diagnoses post-CAMHC assessment[a].

ICD-10 REFERRAL SYMPTOMS	NO DIAGNOSIS (N=17)	SAME DIAGNOSIS (N=12)	OTHER DIAGNOSIS (N=40)
Behavioural problems (N=11)	3	1	7
ADHD (N=15)	8	2	5
ASD (N=13)	2	1	10
Anxiety (N=6)	2	3	1
Language disorder (N=7)	0	5	2
Other non-specified (N=7)	0	—	7
No information (N=10)	2	—	8

Abbreviations: ADHD, attention-deficit/hyperactivity disorder (*DSM-IV*); ASD: autism spectrum disorder.
[a]The diagnostic assessment was performed according to the ICD-10 classification. ICD-10 comprises 6 axes, but only Axes I, II, and III are presented here.

given for these children. For children with an Axis VI diagnosis, only 17 were scored at the beginning and end of the study, so further analyses were not deemed appropriate.

Correlation between referral complaints/symptoms and final diagnoses

The correlation between referral symptoms and final diagnoses is shown in Table 3. Of 69 children, 12 (17%) had referral symptoms that correlated with their final diagnosis post-CAMHC assessment.

Patient pathway from referral to final diagnosis

The mean time taken from the CAMHC receiving referrals for the 69 children to the first meeting with the family was 42 days (SD=23 days), and the mean time taken to the first evaluation was 145 days (SD=101 days). Furthermore, the mean time taken to reach a final diagnosis post-CAMHC assessment was 218 days (SD=148 days).

For the 12 (17%) children whose referral symptoms correlated with their final diagnosis, the mean time taken to reach the final diagnosis was shorter, although not statistically significant, compared with the remaining 40 (58%) children whose referral symptoms were not consistent with the final diagnosis (*P*=.7). For the group of 10 (14%) children who were given a non-specific diagnosis, the mean time taken to final diagnosis was longer, compared with the remaining 44 (64%) children, but this was not statistically significant (*P*=.8).

Discussion

In this report, we found that of the 69 of 88 (78%) pre-schoolers referred to a Norwegian CAMHC and finishing assessment,

almost 4 in 5 had an ICD-10 diagnosis and more than half of the children had a DD. There was a low level of correlation between referral complaints or symptoms and the final diagnosis post-CAMHC assessment.

More than half of the children with an ICD-10 diagnosis were diagnosed with a DD, predominantly specific DDs and ADHD. Interestingly, 10 (15%) of the 69 pre-schoolers referred to the CAMHC were diagnosed with an unspecified diagnosis, of which 'lack of expected normal physiological development' was the predominant diagnosis. It is possible that such high rate of unspecified diagnoses made post-CAMHC assessment is the consequence of a 'wait-and-see' attitude among professionals working with pre-schoolers, or perhaps there could be some degree of caution among clinicians when diagnosing pre-schoolers with a DD. Another aspect also contributing to the complexity of DDs is the presence of medical comorbidities in children with DDs. In this study, 1 in 5 children had a somatic condition, in addition to their DD. This complexity might overshadow or mask the psychiatric symptoms at the time of diagnostic assessment, thus leading to unspecified or incomplete diagnoses, or even wrong diagnoses in some cases. We believe it is possible that the complexity of DDs could lead to considerable uncertainty among primary care physicians over which specialty would be the most appropriate to refer children to.

In this study, nearly 2 out of 3 children referred to the CAMHC were given a diagnosis post-CAMHC assessment that did not correlate with their referral symptoms. One could speculate whether this is a reflection of some of the same issues described by Gillberg.[1] He suggested that in early childhood symptoms presenting in clinical settings with impaired general development, communication and language, social

inter-relatedness, motor coordination, attention, activity, behaviour, mood, and/or sleep may be difficult to disentangle by just one specialist and suggest the specialist would have needed the input of 2 or more of the experts referred to.

Another hypothesis is that the referrers, in this study most commonly general practitioners, were reluctant to commit to any particular child psychiatric diagnoses or deliberately chose to use referral symptoms they believed would facilitate the assessment and conclusive diagnosis of the pre-schoolers by the CAMHC team.

There is a need of intensifying the diagnostic management and more effectively organize the assessment to get started the intervention. We suggest a complementary team, eg, including paediatrician, child psychiatrist, psychologist, and physiotherapist, to assess pre-schoolers referred to the CAMHC, which would ensure prompt conclusive diagnoses, thereby leading to robust management plans. We believe such an approach would benefit and support the developmental trajectory of the child and prevent school dropout in later stages and other long-term outcomes with lower occupational functioning.[14] Furthermore, we hypothesize that an effective logistic patient pathway, despite the high initial costs, would benefit the children, their parents and guardians, and society at last with fewer consultations and increased cost-effectiveness in the long term.[1,15] We recommend further studies for a more detailed evaluation.

Strengths and limitations

One particular strength of the study was that most of all referred pre-schoolers completed their diagnostic assessment. This study has some limitations. The study population was relatively small, and only 1 study centre was involved. Furthermore, the study also was a retrospective review, which is a weakness. Another weakness is the lack of information regarding the referred children and their developmental history who did not reach the clinic. However, the study findings help raise possible hypotheses regarding diagnostic management.

Conclusions

Pre-schoolers referred to the CAMHC have an increased risk for DD. Further comorbidities were found for 1 in 5 of the children. We propose more effectively health care service by developing an interdisciplinary approach for the management of these children.

Author Contributions

IBE, ILD and MS are the architechts behind the design. MS and ILD collected data. SF analysed the data in collaboration with statistic expert RG. All author have made substantial contribution to the writing of the article.

ORCID iD

Irene B Elgen https://orcid.org/0000-0001-6149-0259

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