Anorexia nervosa in Singapore: an eight-year retrospective study

H Y Lee, E L Lee, P Pathy, Y H Chan

ABSTRACT

Introduction: Information regarding the clinical features of patients with anorexia nervosa in Singapore is rare and there have not been any large studies published to date. The aims of this paper were to study the clinical characteristics and features of patients with anorexia nervosa in Singapore, and to compare the clinical features of the early versus the classical later-onset cases.

Methods: 126 cases presenting to the Child Guidance Clinic and the Eating Disorder Clinic at the Institute of Mental Health between 1994 and 2002 were identified and studied retrospectively. All presented with anorexia nervosa or had a past history of it. Subjects were further classified into early-onset (younger than 14 years) or classical later-onset (14 years and older), and a comparison was done between the two groups.

Results: The large majority were female students with a mean presenting age of 17.6 years. 65.1 percent were of the restricting subtype. 84.1 percent were Chinese, 7.9 percent were Indians and 4.8 percent were Malays. Mean presenting body mass index (BMI) was 15.56. Depression was the most common co-morbid condition affecting 25.4 percent of the sample. The number of new cases increased significantly from six in 1994 to 24 in 2002 (p-value equals 0.002). Commonest precipitating factors were comments from others, school and work stress. 11.1 percent were previously members of trim and fit club in school. 42.7 percent of late-onset cases compared to 16.2 percent of the early-onset were of the binge-purge type (p-value equals to 0.005) and had a higher presenting BMI (15.91 ± 2.90 versus 14.74 ± 2.14, p-value equals 0.003).

Conclusion: The clinical characteristics of patients with anorexia nervosa in Singapore are similar to that reported in western literature. The Malay population appears to be under-represented. There was a significant increase in numbers presenting over the last two years. The early-onset cases tend to be of the restrictive-type and had a lower presenting BMI than the later-onset group.

Key words: anorexia nervosa, body mass index, depression, eating disorder

Singapore Med J 2005; 46(6):275-281

Department of General Psychiatry
Institute of Mental Health and Woodbridge Hospital
10 Buangkok View
Singapore 539747

H Y Lee, MBBCh, MMed
Registrar

P Pathy, MBBS, MMed
Consultant

Department of Behavioural Medicine
Singapore General Hospital
Outram Road
Singapore 169608

E L Lee, MBBS, MMed
Consultant

Biostatistics Unit
Faculty of Medicine
National University of Singapore
Singapore 117597

Y H Chan, B Maths, PGDip, PhD
Head

Correspondence to:
Dr Lee Huei Yen
Department of Behavioural Medicine
Singapore General Hospital
Outram Road
Singapore 169608
Tel: (65) 6222 3322
Fax: (65) 6321 4015
Email: gdmlhy@sgh.com.sg

INTRODUCTION

Anorexia nervosa has historically been seen as a western affliction and had previously been classified as a "culture bound" syndrome[1]. A review of eating disorders in the Far East reported that eating disorders in Asian populations have received little attention as they have been predominantly viewed as being associated with the western culture[2]. Prevalence rates for anorexia nervosa in Japan range from 0.025% to 0.030%, while community studies in China have found the prevalence to be 0.01%. The prevalence for anorexia nervosa in western countries was found to be between 0.2% to 0.9%[3]. Despite the lower prevalence rates compared with western countries, there have been increasing literature and reports about anorexia nervosa in Asia[4,5]. There is no doubt that this western affliction is fast spreading to Asia, Singapore included.

With Singapore's growing economy and industrialisation, we are also fast becoming "westernised" in many other aspects. Along with the affluence and abundance of food associated with western culture, we have also inherited their ideas of equating beauty with thinness, and thus the relentless pursuit of thinness. We are faced daily with thin "beauties" in western magazines, television shows, advertisements and movies. Many of these women presented are unusually thin and underweight. Locally, the business of slimming has also expanded in the last decade. A recent count of three different local popular women's magazines showed no less than eight slimming advertisements in each issue. In a study of Chinese Singaporean youths, Wang et al found that 53% of females and 28% of

males wanted to be thinner[6]. Dissatisfaction with body size and shape increased with tertile of adiposity among females, and thoughts of dieting and becoming thinner were present, even among underweight girls[6].

Information on eating disorders in our local context is scarce. In 1982, the first case series of seven cases of anorexia nervosa[7] as well as a case report of bulimia nervosa[8] were published. Since then, there has only been one other study in 1997, describing the clinical features of 50 patients with bulimia and anorexia nervosa[5]. There have been no large studies to date published on anorexia nervosa alone. We therefore set about to study the clinical characteristics and features of patients with anorexia nervosa in Singapore. We also compared the early- and later-onset cases to determine if there were any differences in their clinical features and presentation.

METHODS

Patients with eating disorders presenting to the Institute of Mental Health are usually referred either to the Child Guidance Clinic (CGC) or the Eating Disorder Clinic (EDC), which was established at the Institute of Mental Health in 1994. CGC sees cases under 18 years of age, whereas EDC attends to cases 18 years old and above. We obtained consent from the Institute of Mental Health research and ethics committee to review the case records of patients seen at CGC and EDC. Following a review of records of patients seen from 1994 to 2002, 138 patients were recorded to be suffering from anorexia nervosa. The case records of 131 patients were available for analysis.

In this study, anorexia nervosa was defined using the criteria listed in the DSM-IV[9]. Patients were also classified either as binge-purge type or restrictive type according to DSM-IV criteria. Patients either presented with anorexia nervosa or had a past history of the illness. Five patients did not satisfy the criteria and were thus excluded from the study. Of these, three were underweight but did not have any other features of anorexia nervosa, one did not satisfy the weight criteria, and another was later diagnosed to have weight loss as a result of a medical illness.

Of the remaining 126 patients, 61 had presented to CGC and 65 to EDC. The following information was obtained from their case records: patient demographics, age of onset (defined as the point dieting began), age of presentation, presenting weight, height and body mass index (BMI), psychiatric co-morbidity, source of referral, year of presentation, precipitating factors, and school attended.

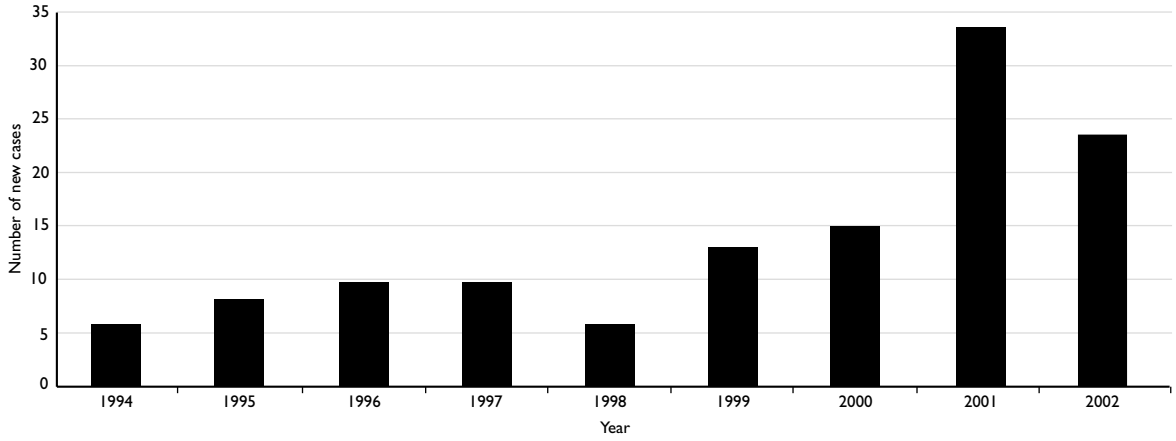
Table I. Patient characteristics, birth rank, source of referral and social class.

	Number	Percentage (%)
Gender		
Female	115	91.3
Male	11	8.7
Marital status		
Single	117	92.9
Married	7	5.6
Divorced	2	1.6
Ethnicity		
Chinese	106	84.1
Malay	6	4.8
Indian	10	7.9
Others	4	3.2
Occupation		
Students	93	73.8
Employed		
– Professionals (group 2)	4	3.2
– Associate professionals and technicians (group 3)	7	5.5
– Clerical workers (group 4)	5	4
– Service workers / shop and market sales workers (group 5)	5	4
– Plant and machine operators and assemblers (group 8)	2	1.6
Unemployed	9	7.1
National service	1	0.8
Birth rank		
First-born/only child	71	56.3
Middle child	17	13.5
Last-born	38	30.2
Source of referrals		
Polyclinic	23	18.3
Other hospitals	22	17.5
Self-referrals	20	15.9
School health service	18	14.2
General practitioners	17	13.5
Other psychiatrists	13	10.3
School	8	6.3
Counsellors	2	1.5
Others	3	2.3
Social class		
I (professional)	12	9.5
II (intermediate)	40	31.7
III (skilled non-manual)	25	19.8
IV (semi-skilled manual)	11	8.7
V (unskilled manual)	15	11.9
Retired	1	0.8

Table II. Presenting features of subjects.

	Mean	Range	Standard deviation
Age of onset of symptoms	15.5 years	6-41 months	3.85
Age of presentation	17.6 years	6-43 months	4.9
Duration of illness prior to presentation	26 months	1-168 months	31.1
Presenting weight	39.5 kg	18-64 kg	8.67
Presenting height	1.59m	1.22-1.83m	0.07
Presenting BMI	15.56	10.2-24.6	2.74
Subtype	Number	Percentage	95% CI
Restrictive	82	65.1	56.1-73.4
Binge-purge	44	34.9	26.6-43.9

Fig. 1 Number of new cases seen per year in EDC/CGC.



Subjects were further classified into either early-onset (age of onset less than 14 years, n=37) or later-onset (age of onset 14 years and above, n=89), and a comparison was done between the two groups. There is no clear definition of early-onset. However, several studies in the past have used 14 years old as a cut-off for defining early-onset[10-12]. It was thus decided that those with age of onset 14 years and above would be classified as later-onset, while the rest would be considered early-onset cases.

Analyses were carried out using Statistical Package for Social Sciences (SPSS) for Windows version 11.0 (Chicago, IL, USA) and SAS 6.2 (SAS Institute Inc, Cary, NC, USA) (for poisson regression). Descriptive statistics (with 95% confidence interval (CI) calculated where appropriate) were presented. Differences in quantitative variables between the early- and late-onset groups were determined by 2-sample t-test if normality and homogeneity assumptions were satisfied, otherwise Mann-Whitney U-test was applied. Association of categorical variables with onset types was assessed using chi-square or Fisher's exact tests. The trend of the increasing number of cases over years was determined using poisson regression. Statistical significance was set at p-value <0.05.

RESULTS

Patient characteristics, birth rank, source of referral and social class are shown in Table I. The Malay population appeared significantly under-represented (p=0.009). Social class was determined using the UK Registrar General's classification of father's occupation[13]. Subjects working were classified under the Singapore Standard Occupation Classification[14]. Of those working (n=23), 21.7% (n=5) were in professions in which beauty and image played a large role – two were air-stewardesses, one was a model, one was an actress, and one was a show assistant.

The presenting features are summarised in Table II. 40 (31.7%) had co-morbid psychiatric diagnoses. Of these, 12 had more than one psychiatric diagnosis. 33 (25.4%) had co-morbid depression, five (3.9%) had anxiety, four (3.2%) had obsessive-compulsive disorder, five (3.9%) had some form of substance abuse and three (2.3%) were diagnosed

to have some form of personality disorder (Table III). The number of new cases presenting each year has increased dramatically from six in 1994 to 24 in 2002 (p=0.002, RR=4.0, 95% CI 1.6 - 9.8, poisson regression) (Fig. 1).

74 (58.7%) were able to give a definite precipitating event for their weight loss (Table IV). 15 (11.1%) were previously members of the trim and fit (TAF) club in school and seven of them cited being picked for the TAF club as a clear precipitating factor. Of the 95 cases that had the school recorded, 45 (47.3%) were from girls' school, one (1.1%) from boys' school and 49 (51.6%) from mixed schools.

Of the late-onset cases, 42.7% were of the binge-purge type compared with only 16.2% in the early-onset cases (p=0.005, OR = 3.8, 95% CI 1.5 to 10.2, chi-square test). The early-onset group also had a lower presenting BMI (14.74, sd = 2.14) compared to the later-onset group (15.91, sd = 2.90), p=0.003, Mann-Whitney U-test). There were no other significant differences in the comparison of the other clinical features (Table V).

Table III. Psychiatric co-morbidity

Psychiatric diagnosis	Number	Percentage (%)
Depression	24	19.0
Depression and anxiety disorder	3	2.4
Depression, anxiety disorder and alcohol abuse	1	0.8
Depression and obsessive compulsive disorder	3	2.4
Depression and personality disorder	1	0.8
Depression and oppositional defiant disorder	1	0.8
Alcohol dependence	1	0.8
Substance abuse and personality disorder	2	1.6
Substance abuse and anxiety disorder	1	0.8
Obsessive compulsive disorder	1	0.8
Bulimia nervosa	1	0.8
Conduct disorder	1	0.8

Table IV. Precipitating factors.

Precipitating event	Number	Percentage (%)
Unrecorded	52	41.3
Teasing / comments from others (including TAF club)	34	26.9
Stress (school/ work)	15	11.9
Peer pressure	6	4.8
Relationship problems	5	4
Health reasons	4	3.2
Family conflicts	2	1.6
Started gym/ ballet lessons	2	1.6
National service	1	0.8
Failed to get into pageant	1	0.8
Fear of resembling overweight sibling	1	0.8
Others	3	2.3

DISCUSSION

The typical Singaporean patient suffering from anorexia nervosa is a single, female, teenage student. This profile very much fits that reported in western literature. Interestingly, the majority of patients are ethnic Chinese. Singapore is a multiracial society. Our population consists mainly of ethnic Chinese (76.7%), Malays (13.9%), Indians (7.9%) and others (1.5%). In our study, Chinese accounted for 84.1% of the patients, Indians 7.9%, and Malays only 4.8%. The Malay population thus appears under-represented in this study. The results are in contrast to a national health survey in 1998[15], which showed that obesity was most prevalent in Malays (16.2%) followed by Indians (12.2%) and Chinese (3.8%). The ethnic differences were more pronounced in females. The study also showed that the age-standardised obesity rate had risen significantly among the Malays from 11.5% in 1992 to 15.3% in 1998. One wonders if the Malays are socioculturally protected in some way as the Malay culture has traditionally placed less emphasis on the thin ideal. The reasons why there are seemingly fewer Malays with anorexia nervosa, be it the diet or some other sociocultural protective factors, or whether the cases are simply not presenting for treatment, either through lack of awareness or understanding of the illness, remains to be elucidated.

Several authors have found social class distribution to be consistently weighted towards social class I/II[16-18], i.e. families whose breadwinners are professionals or in intermediate professions[13]. The distribution appears to be fairly even in this study. There was no marked overrepresentation of patients from social classes I and II. Theander (1970)[19] noted a progressive increase in proportion of patients from the lower social classes, which he attributed to an increase in awareness and recognition.

It is not surprising that a large percentage (56.3%) were first-borns and only children. This group has traditionally been associated with the traits of perfectionism, discipline and control, known to be overachievers – seemingly factors related to the pathogenesis of anorexia nervosa[20]. However, results of studies of birth order in anorexia nervosa have been inconsistent[21] with some studies citing an excess of first-borns and others finding an excess of later-borns. In this study, although a large majority

Table V. Comparison of clinical characteristics between early- and late-onset cases.

	Early-onset (n)	Late onset (n)	p-value
Subtype			
Binge-purge	6	38	0.005*
Restrictive	31	51	
Gender			
Female	34	81	0.548
Male	3	8	
Marital status			
Single	37	80	0.216
Married	0	7	
Divorced	0	2	
Ethnicity			
Chinese	29	77	0.154
Malay	2	4	
Indian	6	4	
Others	0	4	
Birth order	1.46 (SD 0.61)	1.69 (SD 1.00)	0.376
Presenting symptoms			
BMI	14.74 (SD2.14)	15.91 (SD 2.9)	0.03*
Duration of illness prior to presentation	5.61 (SD2.03)	5.65 (SD 2.4)	0.960

* Statistical significance p<0.05

are first-borns, it is not possible to state if this was significant as there was no comparison control group.

The mean age of onset was 15.5 years, which is very much similar to western figures in which the disorder most commonly arises in middle adolescence[18,22,23]. There appears to be an earlier "peak" at 12 years of age. This appears to correspond with the transitional period when these youngsters would graduate from primary to secondary school. This tumultuous period coupled with the physical and emotional changes associated with puberty could have contributed to this "earlier" peak.

The common psychiatric conditions associated with anorexia nervosa – depression, anxiety, and obsessive-compulsive disorder[24,25] – are also seen in this study, with 25.4% of patients suffering from depression. Depression has been viewed as being secondary to the dieting and the state of starvation rather than as a separate entity. It was one of the symptoms identified in a well-known study in 1950 by Keys et al on the effects of semi-starvation on normal volunteers[26]. Dieting contributes to negative affectivity. Consistent with the above-mentioned theory, longitudinal studies indicate that dieting predicts onset of major depression[27].

Not surprisingly, the large majority of referrals were made by other doctors (74.6%). This figure is similar to that reported in Ung et al[5]. Interestingly, although 73.8% of the cases were students at time of presentation, only 6.3% were referred by the schools. Perhaps more could be done in terms of educating the schools on the detection of eating disorders.

There has been a dramatic four to six fold increase in cases from six in 1994, to 34 and 24 cases in 2001 and 2002, respectively. This is in tandem with the increasing trend in the west. An incident study conducted in northeast Scotland[28], revealed that between 1965 and 1991, the incidence of anorexia nervosa increased nearly six fold, from 3 per 100, 000 to 17 per 100,000. The increasing trend has generally been acknowledged as due to increased societal pressures and media bombardment that "thin is beautiful", but also possibly reflects the increased awareness and recognition of the condition such that more are coming forward for help. Although the specific aetiology and pathogenesis of anorexia nervosa is unknown, it often begins after a period of severe food deprivation for a variety of reasons. In this study, 58.7% were able to identify a definite precipitant to their dieting behaviour. The commonest precipitating factor (26.9%) was comments or teasing from others about their weight.

15 (11.1%) of the patients were previously members of the TAF program and almost one-half of them (n=7) cited being selected for the TAF program as a clear precipitant. The TAF program is a nationwide program launched in 1992 in the hope of stemming the increasing number of obese children. It is a compulsory program for students who are identified to be overweight. Its aims were to educate students on the need to lead a healthy and physically active lifestyle through proper nutrition and regular exercise. The number of obese students was reported to decrease by 3.64%, from 13.06% in 1996 to 9.42% in 1997 after initiation of the TAF club. Many of our overweight students have benefited from the program. However, it may be prudent to keep in mind that in vulnerable individuals, being picked and commented on as being overweight in adolescence, may predict greater eating problems in the longer term. Elevated adiposity is thought to constitute a risk factor for the development of eating pathology because it fosters social pressure to be thin. As Ung et al commented[5], perhaps basic information on eating disorders should be incorporated into the programme and students followed-up for the development of eating disorders.

It is interesting to note that although single sex girls' schools account for only a small percentage (8.5%) of schools in Singapore, of the 95 cases that had the schools documented, an overwhelming 47.3% were from single sex girls' schools. There could be several reasons for this discrepancy. Firstly, the disorder occurs nine out of 10 times in girls. It is thus not surprising to find it more prevalent in girls' schools. Secondly, with the absence of boys in all girls' schools, female bonding may be stronger and peer influence thus has a larger role to play among these teenage girls. Peer messages, in the form of girlfriends' discussion of weight and weight loss techniques or weight-related teasing, may be influential during adolescence[29].

The results of the second part of the finding correlates with other studies in the past comparing early- and late-onset cases – a significantly larger proportion of late-onset cases were of the binge-purge type compared with the early-onset cases. The converse then also holds true - that the binge-purge type tends to be of older onset. Several studies support this, having found clear differences between the two subtypes[30-32]. Those with bulimic symptoms were different in several aspects to the restrictive type, including an older age of onset, higher BMI, exhibiting impulsive behaviour, general emotional distress and greater psychopathology[5,32,33]. In summary, the binge-purge type anorexic tends to be more similar to their bulimia nervosa counterparts.

There were several limitations to this study. Firstly, it is a retrospective study and thus depended to some extent on how well documented the case records were. Secondly, although this is the largest study published to date on anorexia nervosa in Singapore, the numbers are still relatively small, and we are unable to assess the true prevalence and incidence of anorexia nervosa in Singapore.

In conclusion, this is the first large study to be done on anorexia nervosa locally and allows us a glimpse into the typical characteristics of an anorexic patient in Singapore and compare it with that in western countries. We conclude that their clinical characteristics are much similar to that reported in western literature. There has been a significant increase in numbers presenting over the years, which is also in keeping with that reported in the west. The under-representation of the Malays is also an interesting finding. The authors are planning a large community-based prevalence study to identify the true extent of anorexia nervosa in our population. Only then can we identify whether the Malays are in someway protected or are simply not accessing treatment. Further prospective case-controlled studies are also needed to evaluate if stress at school, being in the TAF club or an all girls' school are real risk factors for the development of anorexia nervosa.

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