

PAPERS

The aetiology of oligomenorrhoea and/or hirsuties: a study of 467 patients

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Summary

An analysis of 467 patients with oligomenorrhoea and/or hirsuties in respect to duration of the menstrual cycle, body hair growth, ovarian size and the presence of psychological factors has revealed some useful pointers to diagnosis in this syndrome. Some 70% probably suffered from polycystic ovarian disease. Hirsuties and post-pill amenorrhoea are strong pointers to such a diagnosis. Some 10% of the cases may have been psychogenic in origin and are notably found among non-hirsute patients with normal sized ovaries. Another 10% may have been physiological in nature. All other disorders accounted for no more than 10% of the cases. Anorexia nervosa and ovarian dysgenesis are particularly to be found among amenorrhoeic, non-hirsute patients with normal sized (or small) ovaries accounting for no less than 37% of this group in our series.

KEY WORDS: oligomenorrhoea, hirsuties, menstruation, ovaries.

Introduction

Rational therapy in any group of disorders depends upon good differential diagnosis. Recently considerable advances have been achieved in this respect in patients with oligomenorrhoea and/or hirsuties often associated with infertility (Hull, 1981). We here present an analysis of the causes and their relative prevalences in 467 such patients with respect to duration of the menstrual cycle, body hair growth, ovarian size and presence of psychological factors. Pointers to correct diagnoses are discussed.

Patients and methods

The 467 patients, drawn from a total of 689 seen with oligomenorrhoea and/or hirsuties, are those in whom ovarian size was determined at gynaecography or, in a few cases, laparotomy. It had been planned to

undertake gynaecography in all, but this was not possible for a variety of reasons. These include withdrawal from follow-up, refusal of gynaecography, presentation at clinics elsewhere without facilities for gynaecography, and observation at medical clinics for other complaints. Gynaecography was not thought justifiable in older women with established fertility. Later pressure of work prevented gynaecography in some young single women. The great majority of patients, 453 or 97%, were in the 15-35 age range, with extremes of 9 and 47. The mean ages of those in the 15-35 range, were 24, 24, 25 and 23 respectively for the four main groups of patients shown in Table 1.

TABLE 1. Analysis of 467 patients with regard to ovarian size and body hair growth

Ovarian size	Body hair growth	Number of patients
Enlarged	Hirsute	222
	Non-hirsute	49
Normal (or small)	Hirsute	113
	Non-hirsute	83

The average duration of menstrual cycles was determined from basal temperature charts. Hair scores and ovarian indices were determined by methods already described (Ferriman and Gallwey, 1961; Ferriman and Purdie, 1965). Laparotomy with a view to wedge resection was performed in 12 patients with gynaecographically enlarged ovaries and polycystic ovarian disease (PCOD) was confirmed in all. Ovaries were of normal size but polycystic in 9 patients submitted to laparotomy elsewhere either before coming under our care or subsequently; laparotomy was undertaken, specifically for wedge resection in 6, and in 3 others for

menorrhagia, pelvic tumour and bilateral herniae, respectively. The presence of psychological disturbances was assessed routinely at an early stage by one of us (D.F.). These disturbances mainly involved stress and anxiety states (often associated with weight loss), frank anorexia nervosa or depression. The worst affected patients and all those with frank anorexia nervosa were referred to psychiatrists for further assessment and, where necessary, management. Excretion of 17-oxosteroid and, later, plasma testosterone levels were assayed in all hirsute patients. Pregnanetriol excretion was determined only on occasion and was always normal. Buccal smear examinations, pituitary fossa radiographs, follicle-stimulating hormone (FSH) excretion and, later, plasma levels, thyroid function tests and other more sophisticated assays for adrenal, pituitary and hypothalamic function were carried out only when deemed desirable. Prolactin assays did not become available until late in the study and were employed in a few patients only.

Definitions

Useful pointers towards diagnoses emerge when patients are classified as being oligomenorrhoeic or amenorrhoeic, hirsute or non-hirsute, and as having enlarged, normal-sized (or small) ovaries.

Patients were regarded as *normomenorrhoeic* when cycles ranged between 3–5 weeks, as *oligomenorrhoeic* when menstrual cycles lay between 5 weeks and six months, and *amenorrhoeic* when cycles were longer. They were defined as *hirsute* when body hair scores exceeded four and *non-hirsute* when less. Ovaries were defined as *enlarged* when ovarian indices exceeded 20, and *normal-sized* when less (Ferriman and Purdie, 1965); a small group with indices less than 10 were defined as *small*.

Results

The distribution of the 467 patients with regard to ovarian size and body hair score is shown in Table 1. Table 2 shows the menstrual pattern and presence of

hirsutism in relation to the diagnosis reached. Patients with enlarged presumed polycystic ovaries are classified as suffering from PCOD. Patients in whom aetiology is uncertain are classified as idiopathic.

Psychological factors

The prevalences of psychological factors in patients with PCOD and idiopathic disorders, subdivided according to the presence of hirsutism and amenorrhoea, are shown in Table 3. Chi-squared tests show no significant differences between any of the normo/oligomenorrhoeic groups. The differences between the hirsute polycystic and all other amenorrhoeic groups are highly significant ($P < 0.001$ for all); the differences between other amenorrhoeic groups are not. The differences between normo/oligomenorrhoeic and amenorrhoeic hirsute and non-hirsute polycystic groups are also not significant ($P > 0.1$). The differences between normo/oligomenorrhoeic and amenorrhoeic idiopathic groups both hirsute and non-hirsute are however significant ($P < 0.005$ and 0.01 respectively).

Patients with anorexia nervosa and ovarian dysgenesis

All but one of these patients were amenorrhoeic, and all had normal sized (or small) ovaries. Eight of nine (89%) patients with anorexia nervosa were non-hirsute, as were 14 out of 18 (78%) of those with ovarian dysgenesis. These 22 patients constituted 38% of the total of 58 amenorrhoeic non-hirsute patients with normal (or small) ovaries in the entire series.

The prevalences of individual disorders in this series of patients are low. No patients were diagnosed as suffering from hypothyroidism nor organic hypothalamic disease, though one with each was seen in 22 in whom gynaecography was not performed.

Eleven of 15 patients with post-pill amenorrhoea (73%) had enlarged presumed polycystic ovaries. Twelve had suffered from oligomenorrhoea before taking the pill.

TABLE 2. Analysis of 467 patients with regard to aetiology. Numbers of hirsute patients in brackets

Classification	Normomenorrhoea	Oligomenorrhoea	Amenorrhoea	Totals
PCOD	43 (43)	170 (137)	67 (50)	280 59%
Idiopathic	27 (27)	69 (44)	58 (29)	154 32%
Anorexia nervosa		1	9 (1)	10 2%
Ovarian dysgenesis			18 (4)	18 4%
Delayed puberty			3	3 0.5%
Premature menopause			3 (2)	3 0.5%
Amenorrhoea-galactorrhoea		2 (1)	3 (3)	5 1%
Gonadotrophin-releasing hormone deficiency			2	2 0.5%
Pituitary and adrenal adenoma			3 (2)	3 0.5%
Totals	70	242	166	478* 100%

*Eleven patients appear in more than one column due to changes in their menstrual pattern.

TABLE 3. Prevalence of psychological disorders in hirsute and non-hirsute normomenorrhoeic/oligomenorrhoeic and amenorrhoeic patients with PCOD or disorders of idiopathic origin

Group	Normo/Oligomenorrhoea		Amenorrhoea	
	Psychological factors present	Total	Psychological factors present	Total
Polycystic Hirsute	16 (9%)	176	4 (9%)	46
Polycystic Non-hirsute	7 (21%)	33	6 (38%)	16
Idiopathic Hirsute	10 (14%)	71	14 (48%)	29
Idiopathic Non-hirsute	5 (21%)	24	18 (64%)	28

The small ovary

A group of patients with unusually small ovaries (indices less than 10) is of interest. Thirty such patients were invariably amenorrhoeic and infertile contrasting with those having higher indices in whom the duration of the menstrual cycle and prevalence of infertility were much more variable. No less than 50% (15) were suffering from a form of ovarian dysgenesis with normal female phenotype and chromosomal pattern. The remaining patients were suffering from severe forms of primary or secondary ovarian failure, including delayed puberty, premature menopause, Turner's syndrome, anorexia nervosa, amenorrhoea-galactorrhoea, gonadotrophin-releasing-hormone (GnRH) deficiency, pituitary adenoma and post-pill amenorrhoea.

Discussion

Polycystic ovarian disease is clearly a quantitatively important disorder in this syndrome. Some 57% of the patients in this series had enlarged presumed polycystic ovaries. Moreover Smith, Steinberger and Perloff (1965) and Givens (1976) have shown that a substantial proportion of hirsute patients with normal sized ovaries have polycystic changes. The same may be true of non-hirsute patients; PCOD occurs in hirsute and non-hirsute forms which may be related (Ferriman and Purdie, 1979). Nine of our patients with normal sized ovaries (six hirsute, three non-hirsute) proved polycystic on laparotomy. The true prevalence of PCOD in our series may therefore be greater, maybe as high as 70%. Furthermore, hirsuties is clearly a significant pointer to PCOD. No less than 67% of patients with hirsuties in this series had enlarged ovaries. Post-pill amenorrhoea is also a pointer to PCOD. Of the patients, eleven (73%) had enlarged ovaries and 12 (80%) had oligomenorrhoea before taking the pill. Our findings are similar to those reported by Beacons-

field *et al.* (1974) who found 50 out of 55 patients with post-pill amenorrhoea to have enlarged ovaries and 50% with oligomenorrhoea before taking the pill. Some underlying disorder seems likely to be present in such patients. PCOD may not be the only determining factor but clearly it is an important one.

Aetiology in the idiopathic category is uncertain (by definition) but some likely explanations present. It is generally accepted that psychological disturbances (particularly those with associated weight changes) can affect the menstrual cycle, though it may be difficult to decide whether they are causal, contributory or coincidental in individual patients. Psychological factors were present in 19% of the patients analysed in Table 3 (80 out of 423) which would seem rather high in an unselected population. The prevalence in some of the groups was higher than in others. A psychogenic origin seems more likely in patients who are non-hirsute and have normal sized ovaries, particularly if they are amenorrhoeic. The bulk of anorexia nervosa patients possess similar features. Indeed if the numbers of patients with psychological factors and frank anorexia nervosa are combined they constitute 45% of all non-hirsute patients with normal sized ovaries and amenorrhoea (26 out of 58). It is difficult to assign a precise figure for the percentage of patients whose disorder is primarily psychogenic, but around 10% may not be too far from the truth. The role of psychological factors needs further consideration.

Other possibly common differential diagnoses are normal physiological variants of oligomenorrhoea (Haman, 1942; Marshall, 1963) and hirsuties (Ferriman and Gallwey, 1961). These diagnoses are largely by exclusion and it is difficult therefore to put a figure on their numbers, but they may account for around another 10% of our series.

All other causes account for only 7% of our series (Table 2). However, galactorrhoea is a poor marker for hyperprolactinaemia (Franks *et al.*, 1975; Seppala *et al.*, 1975), the prevalence of which would no doubt

have been higher if prolactin assays had been available earlier, perhaps by as much as fourfold (Franks *et al.*, 1975). Further, the cycle initiation defect, a recently delineated disorder, of possible hereditary origin, may be quantitatively important (Hull, 1981). Post-pubertal adrenal hyperplasia (a late onset 21-hydroxylase deficiency) is another possibility—not systematically looked for in our study. Judging from the paucity of reports in the literature it is not considered quantitatively important. The low prevalence of such disorders as hypothyroidism and organic adrenal, pituitary and hypothalamic disorders is noteworthy.

A tentative breakdown of causes under broad headings is suggested in Table 4.

TABLE 4. Tentative classification of major causes underlying syndrome of oligomenorrhoea and/or hirsuties under broad headings

Polycystic ovarian disease	70%
Psychogenic	10%
Physiological	10%
All other causes	10%

A substantial proportion of patients with anorexia nervosa and ovarian dysgenesis are amenorrhoeic, non-hirsute and have normal (or small) ovaries. Together they constitute 38% of patients with this combination of features (22 out of 58). The combination is therefore a strong pointer to the possible existence of one or other of these disorders. FSH assay and ovarian size determinations will assist in diagnosis.

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