Postgraduate Medical Journal (September 1960) **46**, 576–588.

CASE REPORTS

Hyperlipaemic pancreatitis and the Pill

SIMMY BANK
M.B., Ch.B., M.R.C.P.

Consultant Gastroenterologist,
Groote Schuur Hospital

I. N. MARKS
B.Sc., F.R.C.P.Ed.

Part time Head, Gastrointestinal Unit,
Groote Schuur Hospital

Gastrointestinal Unit, Groote Schuur Hospital and the Department of Medicine,
University of Cape Town, Cape, South Africa

THE ASSOCIATION between pancreatitis and hyperlipaemia has been recognized for many years (Poulsen, 1950; Wang, Adlersberg & Feldman, 1959). In the more common variety, hyperlipaemia accompanies the attack of acute pancreatitis and may persist for days, weeks and rarely months before subsiding. Occasionally a basic abnormality in serum lipids is uncovered by lipoprotein electrophoresis in a non-lipaemic phase in between attacks, although the quantitative lipid values are normal (Greenberger *et al.*, 1966). Less commonly the pancreatitis appears to be directly due to the overt underlying lipid abnormality as in the familial or persistent lipoproteinaemias of Fredrickson's type I and V (Fredrickson, Levy & Lees, 1967). The mechanism of the pancreatitis is not understood in these latter cases; even more confusing is the reason why only a small percentage of these patients develop abdominal pain or pancreatitis. Alcohol or gallstones may occasionally precipitate attacks but in the vast majority the attacks are spontaneous. This report presents two patients with hyperlipaemia in whom the attacks of pancreatitis appeared to be related to the administration of oral contraceptive pills.

Case 1

A white female aged 29 years was admitted to a Military hospital on 30 March, 1963, with severe abdominal pain. She had started Conovid (norethynodrel 2·5 mg, ethinyloestradiol-3 methyl-ether 0·1 mg) on 11 March, 2 months after a spontaneous abortion. The abdominal pain radiated through to the back and was associated with vomiting. A laparotomy was carried out on 2 April, and a firm, enlarged pancreas was found. There was no fat necrosis. A needle biopsy of the gland was done and the histology showed 'necrotic pancreatic tissue.' She was discharged on the eighteenth postoperative day and immediately started on Conovid again. Six weeks later a second attack of abdominal pain occurred with all the classical features of pancreatitis. The serum amylase was found to be raised to 370 Somogyi units and treatment with nasogastric suction, intravenous fluids and Trasylol instituted. She remained in hospital for 32 days. On this occasion her serum was noted to be 'milky'. Conovid was recommenced on leaving hospital and she suffered a third, but milder, attack 2 weeks later. The attack settled after a few days and she was referred to the Gastrointestinal Unit for further investigation. Review of the history suggested a possible association between the oral contraception and the attacks of pancreatitis; there was no history of alcohol, trauma or previous attacks of cholecystitis.

On examination: The patient appeared well, and examination of the heart, chest, abdomen and central nervous systems was non-contributory. There were small subcutaneous xanthomatous deposits at the site of previous venepunctures and the fundi showed lipaemia retinalis. The following tests were normal on numerous occasions: barium meal, cholecystogram, intravenous biligrafin, serum calcium, blood urea, LE cells, liver function tests, serum magnesium and sweat electrolytes. Protein electrophoresis showed a normal albumin and slightly raised gamma-globulin on one occasion. There was no pancreatic calcification. The secretin/pancreozymin pancreatic function test showed a low volume and enzyme concentration but the glucose tolerance test was normal. The oral contraceptive tablets were stopped and she was advised to continue with clofibrate and a low fat diet. She has had no further attacks of abdominal pain during the past 6 years despite withdrawal of clofibrate therapy after about

TABLE 1. Fasting lipid values in the two patients.

	Cholesterol (mg/100 ml)	Triglyceride (mg/100 ml)	Phospholipid (mg/100 ml)	NEFA (μEq/l)	Lipoprotein electrophoresis
Case 1	1184	7450	1792	1089	
	1325	5050	625	688	
	875			598	
Clofibrate	725	3910	771		
	780	4900	772		
	482				
Na-d-thyroxine	341				
	222				
	176				
Brother to Case 1	210	1260	262	290	
Clofibrate	346	1558			Chylomicron ++ β Lipoprotein++ No pre β
Case 2	620	1236			
Low fat diet	325	436	344		β Lipoprotein++

a year and the resumption of a normal diet shortly after.

The family were investigated and two of the members found to be lipaemic. A brother of 28, who was found to be lipaemic, had had several attacks of pancreatitis, many of which were related to previous excessive alcohol intake and had recently developed diabetes and her youngest brother of 11 years also had lipaemic serum. Her mother, father, two sisters and another brother had clear serum before and after a fatty meal.

Case 2

A white female aged 46 years was admitted for the investigation of the cause of recurrent attacks of pancreatitis. The first attack had occurred four and a half years previously and 2 months after starting oral contraception with 'Lyndiol' (lynestrenol 5 mg, methoxy-ethinyloestradiol 0·15 mg). She continued to have recurrent episodes of abdominal pain at 3-monthly intervals and was operated on elsewhere during a particularly severe episode. At laparotomy fat necrosis and an enlarged, oedematous pancreas was found and a cholecysto-enterostomy was done. The gallbladder was normal. She stopped the oral contraceptives for 9 months after the operation during which time she had no further attacks of abdominal pain. She suffered a further attack 2 months after recommencing her oral contraceptive, and continued having recurrent mild attacks at 3- or 4-monthly intervals. A further severe attack in January 1969, prompted her readmission to hospital. The attack settled on conservative measures and she was referred to the Gastrointestinal Unit for further investigation. There was no history of alcohol or trauma or family history of pancreatitis.

Examination showed a well-looking, somewhat obese female. The vital signs were normal and physical examination was non-contributory. The barium meal, intravenous cholangiogram, serum electrolytes, calcium, magnesium, blood urea, liver function tests, serum amylase, sweat electrolytes and protein electrophoresis were normal, but the serum appeared turbid and a random cholesterol was 326 mg/100 ml. Gastric acid secretion was low. The pancreatic function tests showed a low volume and enzyme response to secretin/pancreozymin stimulation and a borderline bicarbonate concentration and the glucose tolerance test was found to be abnormal. No members of her family were available for investigation. The oral contraceptive tablets were discontinued and a low fat diet instituted. There have been no further attacks of abdominal pain for the past 12 months. Her serum lipids at this stage were: cholesterol 299 mg/100 ml, triglycerides 543 mg/100 ml and phospholipids 337 mg/100 ml.

Discussion

In both patients the development of clinical pancreatitis occurred within days or weeks of commencing oral contraceptives. It seems unlikely that this was a chance association as recurrent attacks continued while the Pill was being taken and prolonged remissions occurred when these were discontinued. The marked triglyceridaemia and hypercholesterolaemia in the first patient was unquestionably familial in origin and it is likely that the disturbances in fat metabolism were present for many years preceding her attacks of pancreatitis. The nature of the hyperlipaemia in the second patient is less clear as none of her family was available for examination. However, the finding of

high triglyceride and cholesterol levels some months after the attacks in the absence of overt diabetes suggests a primary hyperlipoproteinaemia rather than a pancreatitis or hormone-induced abnormality.

The mechanism of development of pancreatitis in hyperlipaemic states is obscure, the most favoured explanation being vascular sludging due to the chylomicronaemia. It is possible that oral contraceptives, which have been claimed to increase the tendency to vascular thrombosis and also to elevate the serum levels of certain blood clotting factors, may set the foundation for enhanced chylomicron aggregation and clustering. Alternatively the hormonal effect of the Pill may aggravate one or more of the mechanisms suggested for the development of secondary pancreatitis-induced hyperlipaemia, viz., acute diabetes, the release of triglycerides from areas of fat necrosis, pancreatic α cell damage, increased release of glycerides from the liver into the plasma, defective intravascular clearing of glycerides due to lipoprotein lipase inhibition or indeed, the aggravation of the pre-existing defect in lipid metabolism (Marks, Bank & Louw, 1968). Fredrickson has found that oestrogens tend to raise and progesterone to reduce serum glyceride levels (Glueck *et al.*, 1969).

The findings in the cases represented in the present paper suggest that pancreatitis be considered in patients on oral contraceptives who develop abdominal pain. While there is no evidence that oral contraceptives preciptitate pancreatitis in patients with normal serum lipids, it is possible that pancreatitis may be a real hazard in patients with a pre-existing hyperlipaemia.

Acknowledgments

We would like to thank Drs A. Swanepoel and B. Dreyer for permission to publish and Dr L. Krut and Dr S. Truswell for carrying out the lipid examinations. This study forms part of a grant from the South African Council for Scientific and Industrial Research.

References

FREDRICKSON, D.S., LEVY, R.I. & LEES, R.S. (1967) Fat Transport in Lipoproteins—an integrated approach to mechanisms and disorders. *New England Journal of Medicine*, **276**, 148.

GLUECK, C.J., BROWN, W.V., LEVY, R.I., GRETEN, H. & FREDRICKSON, D.S. (1969) Amelioration of hypertriglyceridaemia by progestational drugs in familial Type-V hyperlipoproteinaemia. *Lancet*, **i**, 1290.

GREENBERGER, N.J., HATCH, F.T., DRUMMEY, G.D. & ISSELBACHER, K.J. (1966) Pancreatitis and Hyperlipaemia: A study of serum lipid alterations in 25 patients with acute pancreatitis. *Medicine*, **45**, 161.

MARKS, I.N., BANK, S. & LOUW, J.H. (1968) The Diagnosis and Management of Pancreatitis. *Progress in Gastroenterology*, vol. 1. p. 412. Grune & Stratton, New York and London.

POULSEN, H.M. (1950) Familial lipaemia: A new form of lipoidosis showing increase in neutral fats combined with attacks of acute pancreatitis. *Acta Medica Scandinavica*, **138**, 413.

WANG, C., ADLERSBERG, D. & FELDMAN, E.B. (1959) Serum Lipids in Acute Pancreatitis. *Gastroenterology*, **36**, 832.

Complete agenesis of the lung

H. A. SAMAAN
F.R.C.S., F.R.C.S.E.

Department of Thoracic Surgery,
The Royal Infirmary, Edinburgh

SCHNEIDER (1909–1913) divided pulmonary agenesis into three main degrees:

(a) True agenesis—a group in which there is complete absence of bronchi, alveolar tissue and their blood supply.

(b) A group in which a rudimentary bronchus arose from the trachea with no pulmonary tissue investing its tip.

(c) A group with a poorly developed main bronchus invested by a fleshy mass of ill-developed pulmonary tissue.

Agenesis may be unilateral or bilateral, involve the whole lung, or be lobar or segmental. The diagnosis is usually made accidentally in asymptomatic patients by X-ray or by physical signs of mediastinal shift. Recognition of the true nature of the lesion is important, so that unnecessary interference is avoided.

Cases of isolated pulmonary agenesis are relatively rare as the condition is more commonly associated with serious malformations of other organs that do not permit prolonged life. Oyamada, Gasul & Holinger (1953) found a high association between pulmonary agenesis and anomalies of musculo-skeletal, cardio-vascular, gastro-intestinal and urogenital systems. Bronchography and angiography may be required to establish the diagnosis.