There is some evidence to suggest that oestrogen exerts its effect direct on the thyroid gland as replacement treatment with oestrogen reduces release of iodide by the thyroid both in normal subjects and in patients with hypopituitarism treated with a constant dose of thyroid stimulating hormone.¹³ On the other hand, oestrogen may also exert an effect in subjects without functional thyroid tissue as it reduces the consumption of thyroxine by patients being treated for myxoedema.¹⁴

Oestrogen treatment certainly increases serum concentrations of thyroxine binding globulin, and it is tempting to link this with the observed fall in free thyroxine concentrations in oestrogen rich states. Ekins argued, persuasively, that the free fraction of thyroid hormones in plasma may not be the sole determinant of tissue response and that the concentration of protein bound hormone may also be important in determining the rate of delivery of thyroxine to target tissues.¹² This hypothesis might explain the reduced free thyroxine concentrations in this study and in pregnancy but would not explain the normal free thyroxine concentrations in cases of congenital excess of thyroxine binding globulin. Possibly, however, oestrogen may affect the rate of delivery of free thyroxine from binding globulin to target tissue.

Franklyn *et al* suggested that the observed changes in free thyroxine concentration in pregnancy might be explained by an oestrogen induced change in the cellular uptake or nuclear receptor binding of thyroid hormones leading to a compensatory fall in the circulating concentration of free thyroid hormone.³ Such a postulate might help to explain the hypermetabolic state associated with pregnancy and also the increase in energy reported by most postmenopausal women receiving oestrogen replacement treatment.

At first sight, the absence of a fall in free thyroxine concentrations in normal women receiving oral contraceptives^{2, 4, 10} is not consistent with the findings of this study. It is difficult, however, to interpret data in women taking oral contraceptives as they are ingesting progestogen as well as oestrogen and these may have opposing effects on free thyroid hormone state. In addition, most courses of oral contraceptives include one week in which tablets are not taken. Consequently results may vary depending on the timing of sampling during the treatment cycle. Furthermore, these women also have ovaries, which, although their function is suppressed, may still influence thyroid hormone metabolism.

In conclusion, the results of this study show that oestrogen treatment induces a physiological decrease in serum free thyroid hormone concentration in subjects free from the influence of ovaries or the fetoplacental unit.

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(Accepted 4 January 1984)

SHORT REPORTS

Food hypersensitivity made life threatening by ingestion of aspirin

Immediate hypersensitivity reactions to food have been well described. In experimental animals concomitant ingestion of acetylsalicylic acid has been shown to amplify the response,¹ but this has not previously been documented in man. We report on a boy who was known to develop mild local symptoms of hypersensitivity to peanuts but who developed a life threatening hypersensitivity reaction after ingesting peanuts in combination with aspirin.

Case report

The patient was a 14 year old boy who had suffered from eczema, asthma, and hay fever since early childhood. His eczema and asthma were exacerbated by contact with cats and dogs, and asthma was also induced by drinking orange squash. His asthma was generally mild. He was taking disodium cromoglycate by inhaler (Spinhaler) twice daily and salbutamol by inhaler as required. He had eaten food containing peanuts on three occasions since the age of 2 and had experienced an identical reaction each time. The reaction started within seconds and was characterised by tingling and dryness of the lips and mouth followed by swelling of the lips and face with a sensation of choking in the throat. Signs and symptoms always passed

within five minutes. He had taken aspirin on several previous occasions with no ill effects.

On the day of admission he had had a mild headache, for which he took two 300 mg tablets of soluble aspirin. Five minutes later he had eaten a piece of cake containing peanuts. He suffered his usual reaction to peanuts and within five minutes was perfectly well. Thirty minutes after eating the cake he became unwell with generalised pruritus, a choking sensation, and extreme shortness of breath, and then he collapsed. On admission to hospital he was unconscious, deeply cyanosed, and covered with an urticarial rash. Pulse rate was 120 beats/minute, and blood pressure was 120/80 mm Hg with arterial paradox of 40 mm Hg. Breath sounds were very quiet, and there was little wheeze. Blood gas analysis showed pH 6.85, carbon dioxide pressure 14.7 kPa (110 mm Hg), oxygen pressure 5.5 kPa (41 mm Hg), and base excess -19.3 mmol(mEq)/l. Electrocardiography showed atrial ectopic beats with periods of sinus arrest. He was given intravenously 0.5 ml of 0.1% adrenalin solution, 50 ml of 8.4% sodium bicarbonate solution, 150 mg aminophylline, 100 mg hydrocortisone, and 5 mg chlorpheniramine. He made a dramatic recovery and within 10 minutes was conscious with mild wheeze and arterial paradox of 25 mm Hg. Forty five minutes after admission he was completely asymptomatic, and he remained well thereafter.

Comment

Animal experiments have shown that aspirin greatly increases the permeability of the gastric mucosa to plasma proteins and that this

effect is delayed by about 30 minutes.² Other studies have shown that 20-30 minutes after the introduction of aspirin into the stomach the absorption of substances with molecular weights of up to 70 000 is greatly increased.^{1,3,4} Recent evidence suggests that this is also true for other parts of the foregut.⁵ The change in permeability permits the development of anaphylaxis to molecules normally too large to cross the gastric mucosa.¹ Anaphylaxis is delayed while the changes induced by aspirin take place.¹

The sequence of events in these animal experiments was identical with that in our patient's severe reaction. This case suggests that aspirin may potentiate the effect of food allergens in man, probably by increased gastric absorption of macromolecules, and may result in unexpectedly severe and life threatening reactions. Patients who suffer even mild immediate hypersensitivity reactions to foods should be warned that they could suffer a dangerous reaction if they take the offending allergen together with aspirin.

We thank Drs Richard West and Douglas Maxwell for permission to report this case.

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(Accepted 29 November 1983)

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Effect of seat belt legislation on injuries in road traffic accidents in Nottingham

Legislation making the use of seat belts compulsory for drivers and front seat passengers of most cars and light vehicles was introduced in the United Kingdom on 1 February 1983. Experience in other countries suggested that this measure would substantially reduce deaths and injuries to occupants of the front seats of motor vehicles in road traffic accidents.¹ We undertook a survey to assess the impact of the legislation on the number and severity of injuries seen in the accident and emergency department of a large teaching hospital.

Patients, methods, and results

We studied casualty records for the three months immediately before and after 1 February 1983. Injuries sustained by the occupants of vehicles in road traffic accidents were graded in accordance with the abbreviated injury scale,² and the injury severity score was calculated.³ The abbreviated injury scale is an anatomical method of grading injuries to give an objective indication of their severity.³ The injury severity score gives a total score for all the injuries and acts as a good prognostic indicator of death after blunt (non-penetrating) injury,⁴ such as usually occurs in road traffic accidents. All our patients had this type of injury.

A total of 437 patients was studied. The table shows injuries by their anatomical distribution and severity and compares those sustained before and after the legislation. The overall number of injuries fell from 295 to 142 (52%) ($p < 0.001$). We classified the degree of each injury according

to the injury severity score as mild (0-3), moderate (4-8), or severe (9 or more). There were fewer injuries in all three categories after legislation, the greatest reductions being in moderate (76%) and severe (90%) injuries. Head and facial injuries were reduced to a greater extent than the average (facial injuries by 72%, and head injuries by 63%); neck injuries were reduced by 50%. There was no overall reduction in the total number of chest injuries.

Non-fatal injuries sustained by car drivers and passengers in road traffic accidents in Nottingham before and after seat belt legislation

Severity of injuries*	No of injuries		Fall (%)	Significance†
	Nov-Jan	Feb-April		
<i>Facial injuries</i>				
Mild	72	24	67	p < 0.001
Moderate	11	2	81	p < 0.025
Severe	10	0	100	p < 0.01
Total	93	26	72	p < 0.001
<i>Head injuries</i>				
Mild	66	30	55	p < 0.001
Moderate	17	0	100	p < 0.001
Severe	6	3	50	NS
Total	89	33	63	p < 0.001
<i>Neck injuries</i>				
Mild	38	23	39	NS
Moderate	3	0	100	NS
Severe	7	1	86	p < 0.05
Total	48	24	50	p < 0.01
<i>Chest injuries</i>				
Mild	19	27		NS
Moderate	4	1	75	NS
Severe	8	1	88	p < 0.025
Total	31	29	6	NS
<i>All injuries</i>				
Mild	245	133	46	p < 0.001
Moderate	29	7	76	p < 0.001
Severe	21	2	90	p < 0.001
Total	295	142	52	p < 0.001

*Assessed with injury severity score.³
 †Using χ^2 test.

Reductions in moderate and severe injuries were greater than average for all four anatomical sites. Few deaths occurred in the accident and emergency department; the number of deaths for the whole of Nottinghamshire fell significantly from 15 to three (80%) ($p < 0.01$). (Statistics of Nottinghamshire road safety department, 1983. Unpublished observation.)

Comment

Many factors other than the use of seat belts influence road traffic accidents. The weather is probably the single most important variable, and we chose to compare these two consecutive three month periods because weather conditions remained reasonably stable from November 1982 to April 1983. The winter of 1982 had been rather more severe, so that a comparison of February to April between the two years would have been less valid.

Compliance with seat belt legislation has been good in Nottinghamshire. Estimates of seat belt use before legislation suggest that 20-40% of seat belts were worn. The figure has now risen to 90%. The patients studied here were not required to state whether they were wearing their seat belts. This was partly because truthful answers could not be guaranteed and partly because the overall effectiveness of the legislation must be judged on its ability to gain compliance as well as on the benefits of compliance. The catchment area of the accident and emergency department remained unaltered throughout the study.

We conclude that the introduction of legislation to make the wearing of seat belts compulsory has been accompanied in Nottinghamshire by a significant and pronounced reduction in the number of deaths and in the number and severity of injuries (particularly to the head and face) sustained by the occupants of cars in road traffic accidents.

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