mere enlargement of the brim: (a) change in the alignment of the lumbar vertebrae and sacrum; (b) change in the angle made by the plane of the brim with the spine.

In hollowing the back, as on tiptoe, the lumbar vertebrae and sacrum form a curve with the convexity directed forward, and their bodies are separated from each other in a fan-like

manner. Compare this with what happens on rounding the back as in squatting, in crouching, or in the lithotomy position. Then the bodies of the lumbar vertebrae are pressed together and form with the sacrum part of a continuous curve which has its concavity directed forwards. The gap between the last lumbar and the first sacral vertebra has closed up. In the present example the angle made by the plane of the brim with the anterior surface of the body of the first lumbar vertebra was, on tiptoe 132 degrees, squatting 108 degrees—a difference of 24 degrees. Both the curving of the spine and the bringing up of the plane of the pelvic brim to a position more nearly approaching a right-angle with the lumbar vertebrae must facilitate the entry and descent of the foetal head.

Bearing down with rounded back brings the coccyx forward and releases the muscles of the pelvic floor for their final task—namely, complete relaxation as the head passes the vulval opening. One can now understand why crouching, squatting, and kneeling are the positions naturally chosen for parturition when women are left to themselves, as it is upon the changing movements of spine and pelvis that the process of natural birth depends, and with which we must be familiar before prescribing ante-natal exercise and before we can make the best use of posture during labour. To get the best results the position adopted must never be a rigid attitude, but a sequence of changing movements as the flexible pelvis accommodates itself to the advancing head.

Ante-natal Exercises

The pelvis, then, is not a rigid structure but is capable of expansion at the symphysis in front and at the two sacro-iliac joints behind. This flexibility, natural in the very young, can

be maintained and developed by means of well-designed exercises even in quite elderly primigravidae, and it can then be utilized during labour by a judicious use of posture, such as sitting, kneeling, crouching, in all of which the pelvic articulations are pulled apart, the pelvic floor stretched, the vagina and rectum drawn up and opened.

To ask an elderly primipara to kneel or squat for the first time during her confinement is to ask for trouble. Her back, her joints, and even her feet are stiff. Hence the necessity for well-chosen exercises in the ante-natal period. Now, the one exercise which fulfils all our requirements is that of squatting: (1) squatting with feet on the ground, knees apart, back well rounded, and the head down between the knees; and (2) squatting with hollow back, knees apart, head thrown back, and eyes directed to the ceiling. These two positions can be combined in one exercise by a slow rocking movement on the feet forward and back while the patient steadies herself by holding on to the side of the bed. The first position is the more important, as when the back is rounded the sacral promontory goes back (the coccyx forward), while the pubic arch is widened and the perineal muscles are stretched transversely.

Conclusion

Perfect ease in parturition is like perfect ease in swimming or in playing games, and necessitates a trained control of muscular contraction and, still more difficult to learn, relaxation of the opposing muscles until the co-ordinated movements become instinctive. Childbirth is really an athletic feat in which the mother must be the chief performer, not her attendant, and to play her part properly she needs specialized teaching and training.

Sir Arthur Keith once said that while the heads of the race were getting bigger the pelvis of woman seemed to be getting smaller. The explanation might well be that the pelvis is adequate but rigid. Civilized conditions and habits have deprived it of its natural elasticity, so that the mother is bruised and the foetal head is crushed during birth instead of its being a process of mutual adaptation and accommodation between mother and child.

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MASSIVE ASPIRIN OVERDOSAGE: RECOVERY

BY

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AND

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In the opinion of Roche Lynch (*Brit. Encl. med. Pract.*, 1939, **12**, 77) aspirin is the drug in commonest use by the general public of this country. In view of the comparative frequency with which overdoses of aspirin are taken and of the absence or inadequacy in medical textbooks of descriptions of the treatment of this acute medical emergency, the following case in which recovery followed the taking of nearly 1,000 grains of aspirin seemed to merit a short account of the methods of treatment employed. Recovery after retention of aspirin in doses exceeding 500 grains, according to the literature, is uncommon.

Case Report

The patient, a married woman aged 57, was admitted to hospital at 8.15 p.m. in a comatose condition, the following history being given by her husband.

For several weeks she had been depressed and suffering from insomnia, for which she had been taking aspirin in small doses.

On the day previous to admission she bought 200 aspirin tablets, of which she took not more than 6 during that day and the following night. On the day of admission, at 12.30 p.m., she took the whole of the remaining tablets, amounting to approximately 970 grains. It is probable that with these was taken rather less than half a bottle of whisky, but exact information on this point could not be obtained. At 1.15 p.m. her husband returned home to find that the usual housework had not been done, but that the patient apparently was mentally normal; she then stated calmly that she had taken the aspirin. At 3 p.m. she was seen by her doctor, who found her normal enough for him to consider that she had not taken an overdose. By 4 p.m. she was sweating profusely and shivering, but mentally clear, her pulse being 104 and respirations 34 and deep. During the afternoon approximately 30 oz. of urine was passed, but no food or fluid was taken except for a cup of tea. At 4.15 p.m., about 4 hours after taking the aspirin, the patient vomited for the first time, and did so again several times during the next hour. Between 4.30 and 5.30 p.m. her pulse rose from 110 to 130, the temperature then being 98.6° and the respirations 36. Mentally she had become confused, being in turn violent and drowsy and complaining of intense irritation of the scalp; this state persisted until admission. Except for some recent loss of weight and night sweats, attributed by the husband to the recently acquired habit of taking aspirin for insomnia, the only finding of significance in the past history was depression over the war, and particularly housekeeping difficulties resulting from rationing.

On admission the patient was unconscious, restless, and sweating profusely, the temperature was 97°, the pulse 120, and respirations 24; there was pronounced exophthalmos and extreme air hunger. The only other abnormalities discovered on physical examination were related to the central nervous system, and consisted of fixed pupils, absent knee- and ankle-jerks, and an extensor plantar response on the left side.

Treatment

In view of the long period of time which elapsed between the taking of the aspirin and admission, and the history of vomiting, it was decided not to wash out the stomach. Morphine, gr. 1/8, was given at once in order to quiet the patient sufficiently to make intravenous therapy possible. The treatment, pathological investigations, and clinical condition during the first 12 hours are summarized in the table.

By the end of the first 12 hours of treatment there was little change in the patient's general condition, restlessness and delirium being still very marked. The blood urea had risen to 108 mg. per 100 c.cm., and, on receipt later in the day of the low result of the alkali reserve of the blood, taken at 9 a.m. (33.5 vols. CO₂ per 100 c.cm. of plasma), a further 16 g. of sodium bicarbonate was given intravenously in a litre of glucose-saline. By the evening the patient was quieter—B.P. 100/46, temperature 102.2°, pulse 90, and respirations 26—but the urine was found to contain much albumin and still to give a strongly positive ferric chloride. On the next day her mental condition had greatly improved, but, in view of the persistent low blood pressure—96/46—the intravenous saline drip was continued. At 9 p.m. intravenous therapy was stopped, the patient having received a total of 6,600 c.cm. of 5% glucose in 1/5 normal saline containing 41 g. of sodium bicarbonate in addition to nearly a pint of plasma. No attempt was made to sterilize the sodium bicarbonate solution, which was made up by the direct addition to the sterile saline of weighed amounts of the ordinary B.P. preparation.

On the following day, the third after admission, the patient was taking fluids by mouth, and the excretion of albumin and salicylates in the urine, although still considerable, began to decrease. The alkali reserve had risen to 63.7 vols., but the blood urea had also risen to 132 mg. By the fourth day the blood pressure was 110/60, and tests for salicylates in the urine, although positive in the morning, were negative by the evening. In the course of the next two days the improvement in mental and physical condition continued; the blood pressure returned to its usual level of 150/80 and the blood urea fell to 50 mg., the alkali reserve being 68.5 vols. The patient was discharged from hospital two weeks after admission, having made a complete recovery, the urine being normal, the blood urea 38 mg., and the alkali reserve 57.3 vols.

Discussion

Clinically the most outstanding features were the signs of intense sympathetic stimulation, such as exophthalmos and profuse sweating; of intoxication of the central nervous system, such as coma, delirium, fixed pupils, absent tendon-jerks, and an extensor plantar response; of vasomotor collapse and dehydration, such as persistently raised pulse rate and low blood pressure; and of acidosis, as evidenced by deep abdominal

Table showing Details of the Case during the First 12 Hours

Time	Intravenous Therapy	Other Treatment	Blood				Urine	Blood Pressure	Temperature	Pulse Rate	Respiration Rate	Clinical Condition
			Alkali Reserve, Vols. CO ₂ %	Blood Urea, mg./100 c.cm.	Plasma Chlorides, mg./100 c.cm.							
9.30 p.m. to 11.0 p.m.	1,500 c.cm. 1/5 N saline with 5% glucose containing 20 g. sodium bicarbonate	Cradled and sponged	47	76			None obtained	140/60	105.6°	150	36	Very profuse sweating (through mattress on to floor under bed). Respirations deep and stertorous. General condition very poor
11.0 p.m. to 12.30 a.m.	1,000 c.cm. normal saline		39	80			Reaction: neutral Albumin: trace Benedict: Strong positive for salicylates Ferric chloride: +++ Salicylates: 450 mg. per 100 c.cm. Rothera: trace	108/54	103°	115	30	Sweating profusely. Respirations less deep. Patient not so restless, but more comatose
12.30 a.m. to 1.15 a.m.	500 c.cm. 1/5 N saline with 5% glucose containing 5 g. sodium bicarbonate	Eucortone 4 c.cm. intramuscularly					Reaction: neutral Albumin: + Ferric chloride: +++ Salicylates: 610 mg. per 100 c.cm. Rothera: nil	95/48	101.6°	110	28	Sweating less; not roused by painful stimuli
1.15 a.m. to 2.15 a.m.								100/44	101.4°	120	28	Just able to be roused; otherwise unchanged
2.15 a.m. to 3.15 a.m.	500 c.cm. plasma	Eucortone 4 c.cm. intramuscularly						96/50	101° to 102°	112	28	Coma not so deep. Taking sips of water. Restless
3.15 a.m. to 5.0 a.m.	500 c.cm. 1/5 N saline with 5% glucose				820		Reaction: neutral Albumin: ++ Ferric chloride: +++ Salicylates: 800 mg. per 100 c.cm. Oxyhaemoglobin and urobilin present R.B.C. and granular casts in deposit	110/56	102.2°	120	30	Knee- and ankle-jerks brisk and equal. Plantar responses indeterminate. Less comatose and attempting to speak. Very restless
9 a.m.	1,000 c.cm. 1/5 N saline with 5% glucose		33.5	88	916			106/56	103.2°	104	30	Responding unintelligently to questions. Tongue very dry; taking fluids by mouth

breathing. In view of these findings the logical treatment appeared to be the administration of morphine in a dose sufficient to control the very marked restlessness, saline intravenously to correct dehydration resulting from sweating and overbreathing and, together with plasma and eucortone, to combat vasomotor collapse, and sodium bicarbonate and glucose to overcome the acidosis. Over 10 pints of glucose-saline containing 330 g. of glucose was in fact given intravenously in the first 48 hours, together with 41 g. of sodium bicarbonate, and had the results of alkali reserve determinations been more rapidly available it is probable that even larger doses would have been indicated in the early stages of treatment. The combination of vasomotor collapse and severe acidosis produced a picture closely resembling that seen in cases of diabetic coma, and in many ways the treatment employed will be seen to resemble that generally adopted in the latter condition; in this connexion the use of plasma and eucortone, in addition to large volumes of intravenous glucose saline, is worthy of note.

The impairment of renal function was probably due to the effect on the kidneys of the severe acidosis and the excretion of high concentrations of salicylates in the urine.

Conclusions

The treatment of acute aspirin poisoning is essentially that of acidosis and dehydration with vasomotor collapse.

Acidosis is best treated by large doses of intravenous sodium bicarbonate and glucose controlled by estimations of the alkali reserve at frequent intervals.

Dehydration with vasomotor collapse should be treated in this condition, as in diabetic coma, by large volumes of intravenous saline, plasma, and eucortone.

VITAL STATISTICS OF ENGLAND AND WALES IN 1941

BY

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It is now possible to make a brief survey of the vital statistics of the year 1941 in comparison with previous years, since the essential provisional figures have been given in the Registrar-General's Quarterly Returns. It is also possible to say something about the first quarter of 1942. Standardized death rates cannot be calculated yet, and the best basis for birth and death rates at the moment is the total mid-1939 population, which figure can be employed for 1941 without serious error provided that the whole of the deaths registered in England and Wales, civilian and non-civilian, are related to it. This has the advantage of avoiding most of the selective errors that would be involved if civilian rates had to be compared with the total rates of pre-war years. Furthermore, as the increase in population between 1937 and 1939 was only about 0.5% per annum, the mean annual deaths from any cause registered in the pre-war period 1937-9 can be taken as a good enough basis for approximate comparison with the deaths registered in 1940 or 1941 without calculating death rates at all. This is the method generally used in this survey for separate causes of death, an "excess" or "deficiency" in 1941 meaning simply the difference between the number recorded in 1941 and the annual average recorded in the three-year period 1937-9. Wherever deaths in years prior to 1940 are given they are the numbers classified by cause according to the revised system and International List introduced in 1940, and are comparable, therefore, with the numbers for 1940 and 1941.

Live births in 1941 numbered 586,778, and the birth rate based upon the mid-1939 population was 14.2 per 1,000, compared with 14.9 in 1939 and 14.6 in 1940. The rate was slightly below the smallest rate hitherto recorded—14.4 in 1933—although the number of births exceeded the minimal total

reached in that year. In the first quarter of 1942 the rate recovered to 15.5, which was above the March quarter rate of any other year since 1931. Stillbirths comprised 3.5% of the total births, compared with 3.8% in 1938 and 1939 and 3.6% in 1940—a highly satisfactory improvement under war conditions.

The 1941 death rate, based on the mid-1939 population and all deaths registered in England and Wales, was 12.9 per 1,000, compared with 12.1 in 1939 and 14.0 in 1940. These included violent deaths caused by the war, however, and a better index of health is provided by the death rate from disease, which was 11.7 per 1,000 in 1941, compared with 11.5 in 1939 and 12.7 in 1940—a remarkably good wartime rate. In the first quarter of 1942, a period of the year which almost invariably registers a higher rate than the year as a whole, the total death rate (including deaths from violence) was only 14.8, compared with 15.1, 19.9, and 17.5 in the corresponding quarters of 1939, 1940, 1941.

The infant mortality rate was 58 per 1,000 live births in 1941, compared with 62 in 1931-5 and 59, 58, 53, 50, and 56 in the five years 1936 to 1940. In the first quarter of 1942 the rate was 61, the lowest ever recorded in any March quarter.

Infective Diseases

Among the infective diseases the following have recorded appreciable increases in deaths during the war:

	1937-9 Average	1940 Excess	1941 Excess
Paratyphoid fevers	29	23	37
Dysenteries	106	79	223
Cerebrospinal fever	624	1,960	1,539
Tuberculosis	26,306	1,838	2,363
Acute infectious encephalitis (and sequelae) ..	562	167	142
Tetanus	94	15	5
Whooping-cough	1,294	—	1,089
German measles	5	27	3
Mumps	9	—	18
Mycoses	82	18	50

The most important increases in 1941 were for tuberculosis, cerebrospinal fever, whooping-cough, and the enteric infections. Tuberculosis has given rise to some anxiety, and the statistics of mortality present features different in some respects from those observed at the beginning of the last war. Deaths from phthisis increased by 2,118 from 1939 to 1940, but there was no further rise in 1941, whereas deaths from tuberculosis of the meninges and central nervous system increased by 202 in 1940 and further by 480 in 1941, as shown below:

	1939	1940	1941
Respiratory	21,542	23,660	23,634
Meningitis	1,684	1,886	2,366
Other sites	2,397	2,598	2,670

Respiratory tuberculosis behaved in the same way in the first two years of the last war, an increase of 2,965 deaths occurring from 1914 to 1915, followed by a slight fall of 34 in 1916. The explanation may be that the additional stresses, physical and psychological, imposed by war conditions proved too much for many patients already ill with phthisis, so that they died in 1940 or 1941 before they would otherwise have done. If this were the only effect produced by the war we should expect no further rise in deaths, but if new infections are on an increased scale the effect of these upon the deaths is likely to appear in 1942 as it did in 1917, when the deaths again rose. When separate ages are examined the increase in deaths from 1939 to 1941 contrasts with that observed from 1914 to 1916 in some important respects; the percentage increases (or decreases) in deaths from 1939 to 1941, and in rates from 1914 to 1916, being as follows:

Age Group	1939 to 1941								1914 to 1916	
	Respiratory		Meningitis		Other		All Forms		All Forms	
	M	F	M	F	M	F	M	F	M	F
0-4 ..	68	121	41	45	48	43	46	51	-6	-2
5-9 ..	114	46	47	74	-14	53	33	53	16	17
10-14 ..	40	15	24	18	23	14	28	14	25	10
15-19 ..	7	9	28	49	-2	-5	7	11	15	22
20-24 ..	5	18	86	45	8	55	8	21	3	14
25-34 ..	7	8	22	35	0	-12	7	7	3	7
All ages ..	10	9	38	43	7	17	11	13	5	7