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Scanning with ^{67}Ga might be used solely for purposes of prognosis for evaluation of the rate of development of the lesion.

SUMMARY

The authors report the results obtained with ^{67}Ga in the scintigraphic exploration of the breast.

They conclude that the radio-nuclide being tested is of no use in diagnosis of mammary neoplasia, due to the hight percentage of false negative results.

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Amniotic fluid embolism analysis of a clinical case

by

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Amniotic fluid embolism was described for the first time some 50 years ago, but its clinical significance has only been appreciated during the past 35 years ([1,2,3,4]).

Its incidence is difficult to evaluate ([4]). According to the literature, the rates vary from 1/8000 to 1/37323 births ([2,3,5,6]); while some authors ([7]) have attributed 10% of 1400 maternal deaths to amniotic fluid embolism.

The percentage of patients who suffer amniotic fluid embolism with no unfavourable results is not known. Anderson found instances in the English literature ([3,7,8]) of 15 patients who had survived episodes with the characteristic manifestation of this morbid condition.

However, despite such a very low incidence, this obstetric accident remains an important cause of maternal and foetal death during labour, delivery and immediately afterwards ([3,4,6,9]).

Even though little has been added to the previous descriptions by various authors on the problems of non-coagulability of the blood or the treatment of

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amniotic fluid embolism, yet past experience has made some contribution to the identification of the factors that predispose to this pathological condition ([3, 4, 7, 10, 11, 15, 16, 20, 22, 23, 24, 27, 28, 29, 32, 33, 34, 35, 36, 40, 41, 44, 45]).

The incidence of amniotic fluid embolism during abortive labour is not known: such an event is of very rare occurrence. The present paper analyses a clinical case with proven amniotic fluid embolism, which was confirmed during abortive labour and ended in the death of the patient, despite intensive and appropriate treatment.

Amniotic fluid embolism is a condition that can scarcely ever be foreseen and cannot be prevented; moreover, the urgency of the situation often precludes recognition of the releasing factor, accurate control of the sequence of events and the interval that elapses between the first symptoms and the response to therapy.

CLINICAL CASE

The patient (B.G., aged 36, file no. 54515/74) was admitted to our department with a diagnosis of cervical incontinence, at the 22nd week of pregnancy. There was nothing pathological in the case-history: menarche at 13 years, menstrual flow was regular in rhythm, quantity and duration. No previous illness, allergies or coagulation disorders were reported. She had been married for 3 years to an apparently healthy man; as regards parity, there had been one pregnancy ending in miscarriage at the third month. The course of the present pregnancy was not modified by any complications.

Nothing pathological was discovered in the various organs and apparatus.

The arterial blood pressure was 125/80 mm Hg.

On gynaecological inspection the cervix was found to be soft, shortened and permeable to the finger.

Echographic tests gave the following data: DBP 5,5 cm, cephalic part presented, localization anterior placental, BCF regular.

All the examination having been made, and found to be within normal limits, the patient was prepared for a cerclage operation by the vaginal route, with antibiotic cover and treatment with orciprenaline.

Thirty hours after the operation the patient complained of pain in the pelvis with moderate emesis, and later there was a sudden loss of amniotic fluid. Infusion treatment was then withdrawn, since symptoms characterized by slight dyspnoea and tachycardia, without sweating, had appeared. The cerclage was removed, but the symptoms nevertheless persisted, and hypotension appeared (arterial pressure, 90/40 mmHg). The therapeutic defences that were adopted (Hydrocortisone, Strophantine, Oxygen, Methylprednisolone, Polygelinum, Morphine, Atropine, Sparteine, Furosemide, Diazepam, Blood, Fibrinogen, Aprotinine) were timely and appropriate, but the general clinical situation worsened.

Obstetric examination showed that the permeability of the cervix was unchanged. The clinical signs of pulmonary oedema due to amniotic fluid embolism appeared: hypotension, tachycardia, defibrination and marked hyperfibrinolysis. A check on blood coagulation was negative after 25 min. Diffuse cutaneous signs appeared (purpura). Fibrinogenaemia was 19 mg%.

The clinical picture progressed rapidly towards death. A considerable quantity of liquid containing blood and serum was aspirated from the upper respiratory tract. Signs of grave cerebral hypoxia appeared, with mydriasis and peripheral cyanosis. The ECG tracings were within the limits of normal. The patient was

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given continuous infusion and transfusion therapy, but she died 2 hrs 30 min after the symptoms had first appeared.

Acute pulmonary oedema was confirmed at autopsy (the histological preparations of the lung, as will be explained below, showed diffuse intra-arteriolar and capillary emboli containing amniotic particles), as well as a haemorragic syndrome with cutaneous purpura and serositis, pleurisy and serofibrinous peritonitis, myocardosis and visceral stasis. The uterine cervix showed venous stasis due to the cerclage. The foetoplacental structures were in conformity with the norm and in the foetus there was a right fronto-parietal « delivery tumour ».

DISCUSSION

Normally the amniotic fluid does not penetrate into the peripheral circulation during pregnancy, labor and delivery ([3,7,10,20]); moreover, the route by which it can be introduced has not been sufficiently demonstrated.

It is thought that one entry route might be opened by laceration of the cervical veins, normally brought about by cervical dilatation ([3]) in the presence of engagement of cephalic presentation, or of uterine contraction together with lower intravenous pressure in the cervix, or of a weaker uterine segment ([1,3,10]).

According to other authors, partial detachment of the placenta in hypertonic labour ([1,28]), or a break in the wall of the uterus, as occurs in rupture of the uterus or in caesarean section, may equally well increase the possibility of accidental infusion ([3,4,10,11,12,13,14]).

Among the predisposing factors, rupture of the amniotic sac is not important; in fact, a not inconsiderable percentage of patients whose deaths from embolism of the amniotic fluid have been reported in the literature, have been shown to have intact membranes and almost complete dilatation of the cervix ([11,15,16,17,18,19]).

The accident may also occur through the use of oxytocin ([3,7,10,11,20,21,22,23,24,25,26,45]), in labour (during delivery or post-partum) in elderly multiparae ([2,3,4,7,10,20,26,27]), or after amnioscopy with lesions of the lower uterine segment ([10,14]), after amniocentesis in the presence of hydramnios ([10,12]), or abdominal trauma ([10,25,45]), or due to increased permeability or fragility of the membranes ([28]). Frequently no satisfactory explanation has been given for the correlation existing between such causes and the embolism. The test of Leary & Herting ([19]) is a helpful one: according to this, transient lacerations of the chorio-amniotic membranes might enable the fluid to pass from the amniotic cavity to the margins of the placenta where, in certain circumstances, it could enter the maternal circulation via the subplacental sinusoids ([29]).

As regards our own case it would be easy to assure that the route of access was the cervical veins, lacerated following cerclage; however, this hypothesis is not supported by two not unimportant data: the absence of metrorrhagia even after removal of the cerclage, and the absence of any lesions found in the cervical vessels by the pathological anatomist.

In practice some blood loss should have been found; this would have been more consistent with the non-coagulability of the blood, which is only found in episodes of embolism of amniotic nature ([3,4,7,8,11,15,16,18,20,22,23,28,30,36,41,43,44]).

The presence of a « delivery tumour » on the head of the foetus and the unaltered dilatation of the cervix, even after removal of the cerclage tape, makes the second hypothesis more probable and also more interesting; it would seem that the rupture of the amniotic sac was followed by partial drainage of amniotic

fluid; the head of the foetus and its « delivery tumour » functioned as a plug for the moderately dilated cervix, and then, under the pressure of the uterine contractions, the remaining liquid was « pumped » out of the membranes, passing successively to the edges of the placenta and then through the subplacental sinusoids ([29]) into the maternal circulation.

Once the amniotic fluid had entered the circulation, the clearly defined syndrome was released.

The theory has been put forward that the rapid deterioration of the patient's conditions might partly be attributed to an anaphylactoid reaction ([3,30,31,32,33]). Such a mechanism has not been well documented in man, nor is this hypothesis very convincing, in that, if death was the result of a Shwartzmann reaction, then intra-arteriolar administration, which has been done experimentally by some authors in animals, would bring about death just as rapidly as intravenous administration ([36]). But this did not occur.

There is in addition one clinical observation which provides another reason for not supporting the theory of anaphylactic shock. Often during caesarean section the peritoneal cavity is contaminated by a considerable quantity of amniotic fluid, meconium, and vernix caseosa, and this occurs without any such dramatic consequences. It is known, in fact, that the peritoneum has a considerable capacity for absorption; many substances are easily absorbed (liquids, drugs, blood, ascites) and therefore the same fate should await the amniotic fluid. If this were not so, anaphylactic shock would be the consequence.

If this possibility is excluded, the mechanism whereby the syndrome is released still has to be explained. Once the amniotic fluid has reached the circulation, it proceeds via the distal ramifications of the pulmonary artery ([3,7]), causing mechanical obstruction. The sudden pulmonary hypertension produced by this means would result in indefinite indirect vasoconstriction of both the pulmonary and coronary arteries. Acute pulmonary hypertension ends as cor pulmonale; the irregular flow into the capillaries and arterioles produces a change in the ventilation-perfusion ratio, causing hypoxia and hypercapnia.

In addition there was bronchospasm with increased production of mucus in the bronchioles ([3,37,38,39]) and non-coagulability of the blood due to defibrination ([3,4,15,16,26,28,41]).

The hypothesis is supported by some that a substance activating the fibrinolytic activity of the plasma derived from the amniotic fluid, with the conversion of plasminogen (profibrolysin) into plasmin (fibrinolysin), would give rise to the haemorrhagic diathesis ([3]). Ratnoff & Vasburgh ([3,10,21]) have observed in such patients a slight increase in the prothrombin time, thrombocytopenia, increase of proteolytic activity in the plasma, with decrease in factors V and VII, and an increase, in the plasma, of activity inhibiting thrombin. However, the only well-documented and consistent change in the mechanism of coagulation is the marked diminution of fibrinogen ([3,28,40]); in our case fibrinogenaemia was 19 mg%. The non-coagulability was not manifested by uterine haemorrhage, since there were no lesions of the uterus, but by diffuse cutaneous purpura.

The congestion of the viscera that can be observed (as in our case) gives an idea of the serious pulmonary hypertension and acute deficiency of the right side of the heart, consequent on the obstruction of the pulmonary arteries ([3,41]). Emboli are often observed in organs other than the lungs, without any apparent clinical significance, nor is it known how these emboli can reach the arterial circulation.

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No correlation has ever been found between the degree of embolism and the severity of the acute episode or the subsequent clinical course.

Microscopically, in the lung, classic alterations have been observed that have been clearly identified and well documented in the past ([2,3,42,43]). The most frequent and most important of these consists in the presence in the arterioles and capillaries of emboli intermingled with particles of amniotic fluid: foetal exuviae, mucin, lanugo, vernix caseosa.

The presence of emboli with amniotic substances cannot always be demonstrated by haematoxylin and eosin stain.

The histological preparations observed by us showed marked embolic obstruction of the capillaries and arterioles of the branches of the pulmonary arteries. Foetal cells and vernix caseosa could be singled out here and there; in fact the histological assessment of the lung, together with the characteristics of the clinical course, confirmed the clinical diagnosis.

In conclusion it can be said that embolism of amniotic fluid constitutes, even today, a morbid event of extreme gravity. It is difficult to anticipate and can be overcome only with the use of the most appropriate therapeutic aids.

Having observed a case in abortive labour, we wondered how such an event could possibly occur at any time during the course of gestation, even in everyday situations in which it is difficult to postulate a serious obstacle to expulsion of the foetus, resulting in increased intra-uterine pressure with consequent massive injection of amniotic fluid into the maternal circulation.

In our case the cerclage must be considered as a mere coincidence, since the amniotic fluid embolism made its appearance after removal of the cerclage.

SUMMARY

Embolism of amniotic fluid during the course of labour, during delivery and post partum is infrequent; still rarer is the occurrence of this accident in a case of abortive labour.

A case of amniotic fluid embolism affecting a patient admitted to this hospital is reported.

Various theories are upheld on the pathogenesis of this pathological condition; in this case support is given to the hypothesis that amniotic fluid was able to pass through lacerations of the membranes to the margins of the placenta, and from that site, because of special circumstances, into the maternal circulation via the subplacental sinusoids.

It is still the case that the gravity of this situation often precludes recognition of the releasing factors, the sequence of events and their control.

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A proposed organizational scheme for a research unit for the diagnosis and prophylaxis of genetic diseases

by

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An organizational scheme aimed at the prophylaxis and diagnosis of the hereditary and chromosomal diseases would provide for:

a) preliminary field-work; *b*) pre-conception out-patient clinics; *c*) pre-natal out-patient clinics.

As regards field-work, the primary phase would consist in promotional and screening work by the various health workers (physicians, obstetricians, social workers, health workers, etc.) in the day-clinics of the district, the health centres, and in the various places where people congregate (schools, housing estates, factories, etc.).

The second phase would provide for a comprehensive system of surgery assistance for couples who require genetic advice so that they can consider responsible parenthood, when impelled to seek such advice because of the actual or presumed presence either in a previous child or in a relative, or in the couple's own heredity, of an hereditary or chromosomal disease. They might also seek advice because of a right and legitimate desire for information.

The whole of the work to be carried out in the surgeries can be divided into

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