POSSIBLE INTERACTION BETWEEN MUSCLE RELAXANTS AND THE
KALLIKREIN-TRYPSIN INACTIVATOR "TRASYLOL"*
Report of Three Cases
BY
GEORGE CHASAPAKIS
Department of Anaesthesia, Municipal Hospital
AND
CHRISTOS DIMAS
Department of Anaesthesia, Hippocration Hospital, Athens, Greece
SUMMARY
The administration of proteolytic enzyme inhibitor, Trasylol, during or shortly after
operation, appeared to influence the effect of muscle relaxants in three patients.

Trasylol (Bayer) is derived from the parotid gland
of the cow, and has the property of inactivating
kallikrein, trypsin and other proteolytic enzymes.
It has been used therapeutically in the treatment
of acute and chronic pancreatitis and also, because
it inhibits the activity of plasmin and the activa-
tion of plasminogen, in the treatment of fibrino-
lytic conditions. Commercially, the drug was first
dispensed in ampoules of 5,000 kallikrein inacti-
vator units (k.i.u.); it is now available in ampoules
of 25,000 k.i.u., as experience suggested that
better results may be obtained with higher doses.
Trasylol may be administered either intravenously
or, during surgery, intraperitoneally.

This paper describes three patients operated on
under general anaesthesia to whom Trasylol was
administered during or shortly after the operation.
Muscle relaxants were used and Trasylol appeared
to influence their effect.

CASE 1
A 55-year-old man had an emergency laparotomy
under general anaesthesia for acute abdominal pain.
Acute pancreatitis was diagnosed and it was decided
to close the abdomen. The operation lasted approxim-
ately 1 hour.
Thiopentone 300 mg and suxamethonium 75 mg
were used at induction, and anaesthesia was main-
tained with nitrous oxide and supplementary
injections of suxamethonium.
During skin suture, at which time the spontaneous
respiration had returned, it was decided at the sug-
gestion of a physician to administer Trasylol 5,000
k.i.u. intravenously. When 2,500 k.i.u. had been given
the amplitude of breathing began to diminish and soon
the patient became apnoeic. Administration of Trasylol
was discontinued and artificial respiration was recom-
mended. Half an hour later spontaneous respiration
began again, and in a further 10 minutes the patient
was sent back to the ward.

CASE 2
A 35-year-old man developed recurrent gastric
haemorrhage during treatment for acute pancreatitis.
Laparotomy was performed. Anaesthesia was induced
with halothane in oxygen, and suxamethonium was
used to facilitate endotracheal intubation; subsequently,
nitrous oxide and oxygen were used to maintain anaes-
thesia, and tubocurarine 30 mg was given intra-
venously.
Diffuse gastric haemorrhage was found and the
surgeon performed a gastro-entero-anastomosis. Atro-
pine and neostigmine were given at the end of the
operation; the patient awoke from the anaesthetic and
spontaneous respiration, both diaphragmatic and inter-
costal, was restored.

The patient was transferred to his bed and 10 min-
utes later the house surgeon administered Trasylol
5,000 k.i.u. intravenously. The patient complained of
respiratory difficulty and soon became apnoeic. Arti-
ficial respiration was performed with an Ambu resus-
citator; 7 minutes later spontaneous respiration recom-
menced and in a further 3 minutes breathing was
adequate.
This occurrence suggested that Trasylol potentiated
the effect of the residual curare. Subsequently, the
patient was treated for some days with Trasylol, with-
out any recurrence of respiratory distress.

CASE 3
A 35-year-old woman underwent operation for the
removal of a uterine fibroid. Anaesthesia was induced
with thiopentone 500 mg, and suxamethonium 60 mg
was given for intubation. During the operation, which
lasted approximately 1 hour, nitrous oxide-oxygen and
tubocurarine 30 mg were given.
Because of diffuse haemorrhage from the operation
site, an intravenous drip was set up containing
Trasylol 25,000 k.i.u. in 500 ml of 5 per cent glucose.

* The first and second cases described here were
presented to the Congress of Association of European
Anaesthesiologists and the Greek Society of Anaes-
At the end of the operation atropine and neostig- minine were injected, spontaneous respiration recommenced, and the patient awoke. At this time about half the Trasylol had been given.

While the patient was in the corridor on her way back to bed, respiration became inadequate and apnoea soon developed. The patient was reintubated without a muscle relaxant being required and artificial respiration was resumed. The intravenous drip was discontinued.

Apnoea lasted for 90 minutes, and spontaneous respiration then recommenced.

DISCUSSION

From the three cases described, it seems that the anti-enzyme Trasylol, when administered during operation or immediately afterwards, may potentiate the effect of muscle relaxants and thus cause prolonged apnoea, or may cause apnoea to recur after the resumption of respiration.

It may be that this anti-enzyme has a neuromuscular blocking action, as some antibiotics are known to have, which is reinforced by the presence of a muscle relaxant. Alternatively, the inactivation of kallikrein, trypsin, or some other proteolytic enzyme may in some way be responsible for this side action.

In view of the experiences reported here, it would seem to be advisable to avoid the administration of Trasylol during and immediately following anaesthesia when muscle relaxants are used. Postoperative administration is potentially the more dangerous since, when respiratory insufficiency or apnoea develops unexpectedly in the ward or in transit from the theatre, there may be delay in establishing adequate artificial ventilation.

If a patient is receiving treatment with Trasylol pre-operatively, it would seem prudent to discontinue the treatment on the morning of the operation at the latest. If it is felt that the administration must continue, the anaesthetist should be aware of the possibility of apnoea and it is recommended that the patient should not be allowed to return to bed until Trasylol administration is complete. The same precautions apply to both intravenous and intraperitoneal administration of Trasylol.

It should particularly be noted that Trasylol is now commercially available in ampoules containing 25,000 k.i.u., five times more potent than those used in the first two cases described here.

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