obtained: $t=1.158$, and with this value $0.25 < P < 0.30$. This value of r does not differ significantly from zero, and therefore the evidence for the correlation is inadequate.

The babies were divided into three groups according to whether they were exposed to anaesthesia lasting up to 10 minutes and under, 10 to 15 minutes, or over 15 minutes (Fig. 2). The variability in the behaviour in delay in onset of continuing respirations of these three groups was similar: $\chi^2=27.94$, $n=34$, $\sqrt{2\chi^2} - \sqrt{2n-1} = -0.713$.

Discussion

Our results are apparently in conflict with established teaching. It appears that with duration of anaesthesia between 5 and 30 minutes there is no correlation between duration of anaesthesia to which the child is exposed and the delay in onset of respiration. However, closer investigation reveals: (1) Our cases were almost entirely limited (93 out of 102) to those exposed to anaesthesia for a duration of 5 to 20 minutes. No comment can be made on what happens outside these limits. (2) One hundred caesarean sections is not a very large sample on which to base dogmatic statements, as a large number of variables enter into the causation of apnoea neonatorum. However, even a trend towards prolongation of delay in breathing with increased time of exposure to anaesthesia is not evident. (3) All anaesthetics given to the mother may delay somewhat the initial respirations of the infant (Cole *et al.*, 1939). However, if the level of anaesthesia be kept light, the amount of anaesthetic passing to the infant may be kept to the minimum, and thus dangerous—from the point of view of respiratory activity—levels of ether in the blood (Smith and Barker, 1942) of the foetus be avoided.

Conclusion and Summary

In cases of caesarean section, provided that the child is extracted within 20 minutes of induction of anaesthesia of the mother, we feel that a calm unhurried approach by the operating team will not adversely affect the child. 102 infants born by caesarean section were investigated regarding the correlation between the duration of anaesthesia to which their mothers were exposed and the delay in breathing which the infants showed. When the duration of anaesthesia did not exceed 20 minutes, no such correlation was observed.

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The Royal Society of Health has informed the Ministry of Health that it is concerned about the pollution of water supplies by copper, galvanized, and polythene pipes. It suggests that the Water Pollution Research Laboratory should investigate the matter. The society states that since the war there have been instances of severe corrosion in copper pipes, particularly in the west of England, and that in other districts there have been reports of an alarming content of copper in piped water. "Illness," the society continues, "has been attributed to the poisoning of the water." Such a hazard is denied by the Copper Development Association, which states: "In this country alone about 30,000 miles of copper pipe are at present installed annually for domestic purposes, and the association has not yet come across any authentic case of copper poisoning from normal water supplies."

EXPERIENCE WITH "NOBECUTANE" IN MINOR SURGERY

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The new plastic dressing "nobecutane" has already been used in general surgical and abdominal operations, and a survey on these lines has been made by Rob and Eastcott (1954). There has, however, been no report on its use in minor and casualty surgery. Dissatisfaction with the progress of wound healing in many military personnel treated in the casualty department of a large military hospital led to a trial of other forms of dressing. This report describes such a trial of nobecutane.

The conventional gauze dressings with a bandage or zinc oxide plaster in minor operations and in the treatment of the lacerations of minor trauma have always been open to criticism. They are easily disturbed by normal use of the affected part and soon become soiled and dirty, with resulting maceration and contamination of the wound. Service men in general are exposed to many sources of trauma in the course of their duties, and conditions for the maintenance of a clean and dry wound are rarely available. To expect a cookhouse orderly whose hands are frequently cut by knives and edges of tins to keep his upper limbs free from moisture and dirt is to expect the impossible.

Nobecutane is an acrylic resin dissolved in a mixture of acetic esters. When applied to the skin this solvent evaporates, leaving a transparent, adherent, and elastic film. The dressing is inert, impervious to bacteria, but pervious to evaporation from the skin surface (Olow and Hogeman, 1953). It is flexible and adheres to the edges of the wound without irritation or maceration of the underlying skin. The principal disadvantages of the dressing are stated to be haemorrhage from the wound edges if these come into contact with the dressing, and difficulty in suture removal if the plastic film is too thick (Wallgren, 1954). The haemorrhage is thought to be due to both a haemolysing and a vasodilating effect of the solvent.

Method of Trial.—Over a six-months period 48 wounds resulting from minor surgical operations and 60 sutured lacerations were dressed with nobecutane. All the operations were performed in a small casualty theatre, using the "no touch" technique and a full aseptic procedure. If the lacerated wound was found to be grossly contaminated, a prophylactic course of penicillin was given; nine of these cases received such a course. A form was prepared on which the patient's name and occupation could be entered together with a description of the wound and the suture technique. The wounds were inspected on the first, fifth, seventh, and fourteenth days after initial treatment and the state of the wound and the treatment it required were recorded.

Results and Complications

At the end of the six-months period of trial it was apparent that the wounds treated with nobecutane were healing quickly and soundly, and that while this was taking place all the patients had been able to continue with their normal duties without running the risks of maceration and contamination of their wounds. The impression was gained that there had been a decrease in the incidence of wound infection, though a comparable control series was not taken.

The infection that did develop was never so severe as to warrant antibiotic treatment, and only local dressings were used to treat the infected wound.

Wound healing could be observed at any stage, as the dressing remained transparent throughout, and results revealed that 76 of the 108 cases (70.4%) had complete healing of the wound by the fifth day. The life of the plastic dressing on parts exposed to water and minor trauma was found to be three days with a thin film used, and five days with a thicker film. Nine cases developed infection of the wound, and after treatment small areas of healing by second intention were present in the scar. This infection occurred in lacerated wounds only, all of which had presented with wounds contaminated by dirt and grit. None of the 48 minor surgical cases developed wound infection and all healed by first intention.

If perfect approximation of the skin edges was not obtained there was often haemorrhage from the wound when nobecutane dressing was applied. This complication occurred in 12 of the cases (11.1%). As a result of experience, all cases with imperfect approximation of the skin edge and those who bled when the dressing was applied had a firm dry dressing for 12 to 24 hours. After this the dry dressing was removed and nobecutane substituted, without any haemorrhage occurring.

Suture removal never proved difficult, as use of the affected part usually resulted in much of the plastic dressing flaking off by the time the sutures were due to be removed.

Illustrative Cases

Case 1.—A slater and tiler doing a dirty job sustained a laceration of the dorsum of the left hand between the bases of the second and third fingers, exposing the extensor expansion at this point. The patient continued with his work after suture and received penicillin intramuscularly for four days. The wound had healed soundly in seven days.

Case 2.—A trainee cook lacerated the tips of his third and fourth fingers of the left hand, and these required 12 sutures to replace the flaps of skin raised by the cut. The patient continued at work, with his hands frequently in water, yet both wounds healed in five days.

Case 3.—Excision of the right retro-auricular sebaceous cyst was performed on a trainee clerk and the wound clean-stitched. The wound healed in five days and then required no further dressing.

Case 4.—A ward orderly sustained a V-shaped laceration on the ulnar side of the base of the right fifth finger. Marked haemorrhagic reaction on the first application of nobecutane required use of a firm dry dressing for 24 hours. This was then removed and nobecutane reapplied. The wound healed, with small areas of second-intention healing, in nine days.

Conclusion

As a dressing for minor surgical and casualty work nobecutane offers many advantages. It is simple to apply and leaves the patient free to continue his work unencumbered by a bulky dressing that soon becomes moist and dirty. The wound heals quickly, and, apart from the risks of haemorrhage on first application of the plastic dressing, the use of nobecutane appears to be free from complications.

This form of dressing is worthy of further trial in all casualty and minor surgical departments.

I thank Colonel W. R. M. Drew, Officer Commanding, Cambridge Military Hospital, Aldershot, for permission to publish these results, and am grateful for the encouragement received from Lieutenant-Colonel A. B. Dempsey during the trial. I also thank Evans Medical Supplies Limited for a supply of nobecutane.

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Medical Memorandum

"Nobecutane" as a Surgical Dressing

A paper written by Rob and Eastcott in 1954 stimulated us to use "nobecutane" as a surgical dressing. Since then we have applied this substance to 204 wounds. At first it was used mostly after operations for hernia and appendicitis, but later after major abdominal conditions. We fully endorse the various points of advantage mentioned by the previous writers, but have been particularly impressed by the absence of sepsis. There was infection in only one of the 204 wounds. This occurred in a man of 84 who underwent choledochoduodenostomy: the wound became infected with clostridia, which organisms had been previously cultured from his bile.

It is our impression that the healing of wounds under this application is somewhat better than under the more standard dressings. The slight reddening of the skin along the suture line that is commonly found in healing wounds is usually absent. It is possible that the splinting action of the plastic reduces the small degree of friction and irritation which must occur in the first few days of healing. •

There are various points which we have learned in the technique of its use. Rob and Eastcott advocated the use of a fine layer of the solution applied with a spray. We have had the best results by spreading the solution thickly over the wound with a glass (colostomy) rod. We believe this method is better, because it seals the wound more effectively and to some extent acts as a splint. Another advantage is that when the stitches are to be removed this thick layer can be peeled off in one piece, with the stitches incorporated in it, by simply cutting each stitch in turn as the plastic is raised and removed; this also obviates any necessity to dissolve the plastic with ether or acetone or peel it off in flakes.

The solution comes out of the spray container as an apparently thinner liquid, which runs about more readily and inconveniently than the more viscid fluid in the ordinary bottle which we apply on a glass rod.

It is important that the solution be perfectly dry before the patient leaves the theatre; and when using the thicker layer some patience is required on the part of the operator, although we have found the process appreciably hastened by using a hair-drier. The drier must be at "cold," as if turned to "hot" it tends to liquefy the drying solution. Slightly tacky opposing surfaces of nobecutane tend to stick to each other a little, particularly with midline or paramedian wounds when the patient sits up: this can be prevented by sprinkling the whole area with talcum powder after using the hair-drier.

As the dressing is impermeable to water, patients may be allowed to take a bath on an early post-operative day.

As Rob and Eastcott pointed out, nobecutane should not be applied to a wound in which perfect haemostasis has not been secured. In these cases we have applied the nobecutane in the wards the next day. We have had no adverse criticisms from the patients; indeed, many of them are interested to see the wound through the transparent covering. In young children we have covered the area with a single strip of gauze and strapping after the nobecutane is dry.

We have found nobecutane an ideal dressing for abdominal wounds adjacent to any enterostomy: they remain in perfect condition in the presence of faecal contamination. More nobecutane is applied after the stitches have been removed. We have, however, not found it suitable as a protection to the skin immediately around ileostomies or colostomies, as the faecal matter tends to burrow underneath it.

I should like to thank Mr. J. P. Hosford and Mr. E. G. Tuckwell for allowing me to apply this substance on their patients. Mr. Hosford also helped in the preparation of this paper.

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