

CASE REPORT

The role of attention in the elimination of chronic, life-threatening vomiting

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ABSTRACT. A 24-year-old retarded client, whose weight over 7 years had fallen from 130 pounds to 72 pounds due to vomiting, was being kept alive for 2 weeks by tube feeding. Behavioural treatment consisted of (a) 30 minutes of non-contingent staff attention, (b) 2 minutes of no attention contingent on vomiting, and (c) a resulting 2-minute delay in cleaning expelled vomitus. In 2 weeks, vomiting of 7 years history was reduced to zero. Through 2 months of follow-up, vomiting remained at zero and weight increased to 97 pounds. The results support previous studies which suggested that vomiting may be reduced and eliminated by manipulating attention.

INTRODUCTION

Vomiting has been reported in 90% of institutions surveyed (Thibadeau *et al.*, 1985). Traditionally, punitive approaches have been used to treat vomiting cases, most commonly electric shock and the oral application of aversive substances. (For a general review of vomiting research, see Singh, 1981).

Studies carefully manipulating contingent attention have shown promise in recent years. When it appeared that handling, changing clothes, and cleaning was operantly reinforcing vomiting behaviour through the attention involved, differential reinforcement of other behaviour (DRO) was used to reduce regurgitation (O'Neil *et al.*, 1979). The elimination of a normal 14-year-old girl's vomiting was reported using attention and praise for intervals of non-vomiting (during meals) and time-out for vomiting (Ingersoll & Curry, 1977). In a similar case, an 11-year-old boy's chronic vomiting was eliminated by his family's ignoring vomiting behaviour but praising, hugging, and kissing him for completing household chores (Munford & Pally, 1979).

Taken together, the literature suggests attention as a viable treatment alternative, especially when compared to procedures that involve special equipment, are aversive, probably fail to meet the least restrictiveness doctrine, may violate rights, can require a great deal of staff training and time, may not generalize, and can be difficult to fade out. The present study explored the use of simple non-contingent attention and contingent withdrawal of attention to eliminate chronic, life-threatening vomiting of a profoundly retarded adult.

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MATERIALS AND METHODS

Subject and setting

The subject, a 24-year, 7-month-old white male resident of a state institution for the retarded, suffered from chronic vomiting. Medical complications included heart and lung ailments. His retardation was classified as level IV (low), profound to severe, with a mental age of less than 2 years, 0 month. The subject had a 7-year history of vomiting dating from the day of his admission to the institution. Historically, he had reconsumed vomitus by scooping it off the floor or table and placing it back into his mouth. However, he had recently been stopped from reconsuming his vomitus by staff as a protection from harm measure, which may account for his sudden, severe weight loss. At his present height of 5' 3", his ideal weight was specified at 127 pounds, and he had weighed 130 pounds when originally admitted.

Several behavioural and quasi-behavioural programmes had been tried over the years. From time to time, the subject was placed on satiation diets consisting of, for example, quadruple helpings at mealtimes plus between-meal snacks. Initially, these diets resulted in temporary vomiting cessations, but no lasting weight gains resulted. Ultimately, reapplications of the satiation diet proved totally ineffective, and vomiting continued. A pattern became clear over the years. Any new intervention, medical, behavioural, or other, might decrease or even stop the subject's vomiting for a time. However, before any substantial weight gain could be obtained, and usually within a week, the effects of the change would be lost, and vomiting would resume. Unsuccessful interventions that did produce short-term results included throat-muscle-relaxing drugs, constant supervision, reinforcement of non-vomiting with Kool-Aid, use of a strait jacket to keep the fingers out of his mouth (he soon learned to vomit spontaneously), and special diets.

When the subject's weight reached a life-threatening low of 72 pounds, he was transferred from the ward to the medical unit so that nursing and doctor care would be at hand 24 hours a day, and so that tube feeding could be initiated to prevent death and to get his weight up. The tube, left in place 24 hours a day, inhibited vomiting for some 5 days, after which vomiting resumed. However, in spite of resumed vomiting the tube feeding did result in sufficient weight gain so that after 2 weeks the tube could be removed and conventional feedings could be resumed. At that point, the following behavioural intervention was initiated.

Conditions

Session 1, baseline. The subject was spoon-fed three snacks, 30 minutes apart between 10.00 a.m. and 11.30 a.m. on the hospital unit. The snacks were $\frac{1}{3}$ to $\frac{1}{2}$ of whatever diet the subject was on at the time, depending on the orders of the physician and the dietician, and were taken from his regular between-meal snack quota, not extra food. Meal consumption took from 1 to 5 minutes to complete. For one session, data were collected with no behavioural intervention. The limit of 1 day for baseline was required by the subject's precarious medical condition and extreme emaciation. No instructions were given to the staff, except to treat the subject as they usually did. This treatment included the customary prompt attention to and cleaning up of the

subject after episodes of vomiting. Regular meals were given as usual during this and all subsequent conditions.

Sessions 2 to 15, differential reinforcement of other, non-vomiting behaviour (DRO). The three special snacks were continued, and the subject was supervised by an aide for the 30 minutes between the presentation of the first and second snacks. As long as the subject did not vomit, he received nearly constant attention during this 30 minutes. This attention included praise, touch, reading a story to him, playing with a ball or a music box with him, or taking indoor or outdoor walks with him. Contingent on vomiting behaviour, however, attention was withdrawn. The subject was treated as if he were invisible, receiving no attention whatsoever. After he ceased vomiting and 2 minutes had passed, he was again attended to and cleaned up.

The treatment package can be briefly described as having three elements: (a) 30 minutes of non-contingent staff attention, (b) 2 minutes of no attention contingent on vomiting, and (c) a resulting 2-minute delay in cleaning the subject and the room of expelled vomitus.

Sessions 16 to 63, follow-up one. The three special snacks were continued, but the treatment package was discontinued and the subject was attended to as normal. After any vomiting behaviour, the subject was promptly cleaned up by staff.

Sessions 64 to 70, follow-up two. The three special snacks were discontinued, and staff were instructed to treat the subject normally.

Discontinuation of Behavioural Treatment. Reassignment of the Behaviour Therapist to other duties ended behavioural treatment for the subject after Session 70.

Data collection

Vomiting definition. Vomiting was defined as any of three occurrences: (a) regurgitated material (may be mixed with saliva but must be milky, not clear) leaving the mouth and appearing on the lips, such as drool or blowing bubbles or foam: does not include saliva on hand or strung between hand and lips, (b) regurgitated material leaving the mouth and dribbling down the chin, down the front of the shirt or bib, (c) regurgitated material pouring from the mouth and collecting in a pile on the floor, on the table, on the pants, or in the lap.

Observational data and reliability. Data were collected each session. Sessions were held daily, excepting weekends and holidays. An observer used a 30-second interval method in which to record whether or not vomiting was observed to occur at any time during the 30-second interval. Observations lasted for the 30 minutes following each of the three special feedings, for a total of 90 minutes.

A second, reliability observer independently observed on 12 (17%) of the sessions spread across all treatment conditions. Computed using total, point-by-point reliability (agreements divided by agreements plus disagreements, times 100), reliability scores ranged from 93% (on one session) to 100% (on eight sessions).

Due to the low rate of occurrence of the behaviour, the more stringent, effective percentage agreement method was also used to compute observer agreement for the four reliability sessions. Session 3 effective percentage agreement was 50% (well above chance agreement, which at that level of responding was 1%); Session 4 agreement was 95% (chance was 11%); Session 7 agreement was 89% (chance was 9%), and Session 11 agreement was 69% (chance was 5%). On the remaining eight reliability sessions, the behaviour was scored as zero by both observers.

Weight Data. The subject was weighed on a doctor's scale by the medical staff daily, including weekends and holidays, as part of the hospital's standard medical care and treatment.

RESULTS

Figure 1 shows the subject's rate of vomiting. On the baseline session, vomiting occurred in nine observation intervals. During the 14 days of DRO treatment, the vomiting rate showed a sharp rise to a 1-day high of 37 intervals, then a rapid drop to 3 days of zero intervals, at which point the treatment was discontinued. During the 47 sessions of Follow-Up One (three special snacks but no DRO), the zero rate was repeated on all but five sessions. Finally, during the seven sessions of Follow-Up Two (no special snacks or treatments), zero vomiting occurred.

Figure 1 also shows the subject's weight before, during, and after treatment.

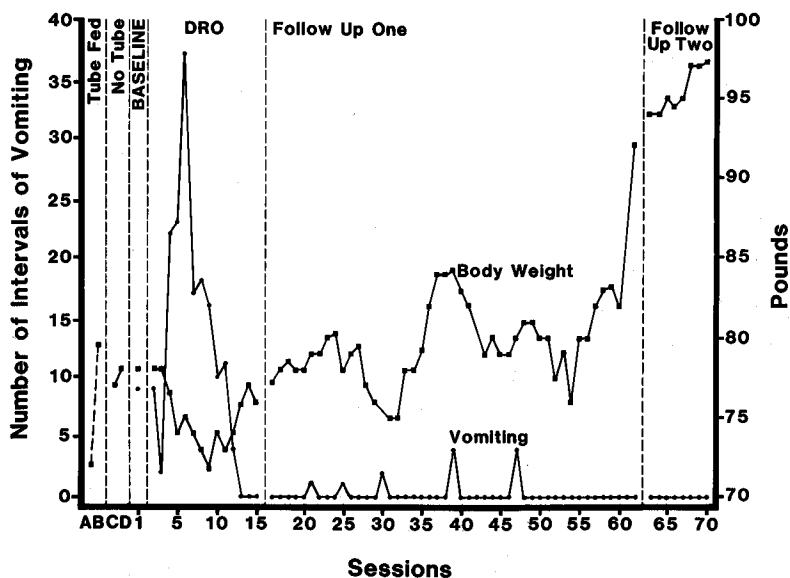


Figure 1 Both body weight (circles and right ordinate scale) and the number of intervals vomiting (squares and left ordinate scale) observed per session. On the abscissa, A-B are 2 weeks of pre-baseline tube feeding and B-C are 2 days of pre-baseline normal feeding during which weight data, but not vomiting data, were collected.

During 2 weeks of tube feeding (designated as A-B on the abscissa) his weight rose to 79 pounds. He lost a pound or two during 2 days (C-D on the abscissa) of no tube feeding. On baseline day, Session 1, his weight was 78 pounds.

During the first half of the DRO treatment phase, the subject's weight fell to 72 pounds. Then it climbed to 76-77 pounds by the end of the DRO. During Follow-Up One, his weight fluctuated, but rose over the course of the condition to 92 pounds. Finally, during Follow-Up Two, a weight of 97 pounds was reached.

DISCUSSION

Seven years of life-threatening vomiting, which had resisted a plethora of previous treatment attempts, was reduced to zero in less than 2 weeks by manipulating staff attention. Equally significant was the fact that continuous follow-up of 2 months without treatment showed a maintenance of the effect, and anecdotal reports by direct-care staff indicated that vomiting was at zero or near zero for the balance of the study (sessions 13-70), including weekends and holidays when treatment was not applied. These anecdotal reports are corroborated by the body weight data, which varied indirectly with the rate of vomiting.

Generalization and maintenance are goals of every behavioural intervention, and of particular interest in cases of life-threatening self-abusive behaviour. However, the maintenance obtained in this study yielded a methodological weakness to the present report. The failure of the behaviour to return to baseline levels after the treatment was suspended, plus the one-session baseline required by the subject's health, reduced the experimental design from an ABA to a simple AB at best, and at worst to a clinical case study. Originally, the three snacks spaced 30 minutes apart were intended to provide a multiple baseline across snacks, eliminating the need for either a lengthy baseline or a reversal. However, when the treatment was applied to only the first snack, vomiting following all three snacks immediately displayed a typical extinction curve, then fell to zero by session 13. No other vomiting clients were available for a multiple baseline across subjects.

The most significant aspect of the present case was the minor amount of staff time and effort required to achieve the result. When staff attention was shifted from vomiting to non-vomiting behaviours, the subject developed new behaviours, following various staff around and exhibiting a variety of attention-getting behaviours, both appropriate and inappropriate. Given the choice, this low-level subject seemed to prefer throwing a ball or turning lights off and on over simply sitting alone and vomiting, as long as each yielded staff attention.

Everyone associated with this work was surprised at the strength and speed of the effect. However, in retrospect, an obvious explanation offered itself. This non-verbal client came to the hospital with virtually no appropriate behaviour with which to gain staff attention, nor had any developed up to the time of this project. but he had always been able to vomit at will and thus generated a great deal of staff attention aimed at clean up and remediation, staff attention contingent on vomiting. Yet the same time that the vomiting got attention, the vomiting also made him unpopular with staff and peers, limiting his opportunities to gain staff attention for other less extreme if more

appropriate behaviours. Evidently the present procedures provided his first exposure to a strict reversal of these attention contingencies, and he responded in the only way he could, by reversing his behaviour. In short, attention for vomiting was completely removed, while he was given a number of clearly appropriate behaviours with a high probability of reinforcement, and he responded accordingly.

A 1984 report on trends in the use of restrictive and aversive procedures to control severe maladaptive behaviour indicated an increase in the use of restrictive and aversive procedures (Egelston *et al.*, 1984). The use of restraints, contingent aversive stimulation, and electric shock, which has been relied upon to treat self-injury in the past, is now becoming unacceptable to society and to residents' rights advocates as less intrusive techniques are developed (Davis & Cuvo, 1980). Any technique recognizable as punishment probably should be used only as a last resort (Baer, 1986). The present case is a significant addition to the small but growing body of literature supporting a more enlightened, least restrictive approach to the treatment of life-threatening behaviour. It can be viewed as an extension of the valuable work of Ingesoll & Curry (1977) and Munford & Pally (1979), who basically applied attention during non-vomiting and withdrew it when vomiting occurred. However, in those reports, the subjects were normal youngsters whose vomiting was relatively short-term, had no lengthy history of previous treatment failures, and was not life-threatening. In the present study, a profoundly retarded, institutionalized adult had been vomiting for 7 years, was near death, and had failed to respond to uncounted previous treatment attempts.

ACKNOWLEDGEMENTS

This work was supported in part by National Institute of Health Grant HD02528.

We thank the staff of the hospital unit, particularly Helen Steinberg, Maybelle Denny, Charlotte Moore, and Zell Brusco, RN, for their assistance and co-operation.

REFERENCES

- Baer D.M. (1986) For want of a nail . . . : A review of *Evaluating behavior therapy outcome*, R.McM. Turner & L.M. Ascher (eds). *The Behavior Analyst* 9, 197-8.
- Davis P.K. & Cuvo A.J. (1980) Chronic vomiting and rumination in intellectually normal and retarded individuals: review and evaluation of behavioral research. *Behavior Research of Severe Developmental Disabilities* 1, 35-44.
- Egelston J.D., Sluyter G.V., Murie S.S. & Hobbs T. (1984) Trends in the use of restrictive and aversive procedures in a facility for the developmentally disabled persons. *Education and Training of the Mentally Retarded* 19, 306-11.
- Ingesoll B. & Curry F. (1977) Rapid treatment of persistent vomiting in a 14-year-old female by shaping and time out. *Journal of Behavior Therapy and Experimental Psychology* 8, 305-7.
- Munford P.R. & Pally R. (1979) Outpatient contingency management of operant vomiting. *Journal of Behavior Therapy and Experimental Psychiatry* 10, 135-7.
- O'Neil P.M., White J.L., King C.R. & Carek D.J. (1979) Controlling childhood rumination through differential reinforcement of other behavior. *Behavior Modification* 10, 355-71.
- Singh N.N. (1981). Rumination. *International Review of Research in Mental Retardation* 10, 139-81.

Thibadeau S.F., Gruber B.K. & Withstandley J.K. (1985) *The results of a national survey concerning the treatment of rumination in handicapped individuals*. Paper presented at the May meeting of the Association for Behavior Analysis, Columbus, Ohio.

Received 13 April 1987; revised 5 August 1987