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Response of bedwetting to the enuresis alarm

Influence of psychiatric disturbance and maximum functional bladder capacity

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SUMMARY Fifty-four children with nocturnal enuresis were managed with the pad and bell system. Their maximum functional bladder capacity was estimated before they began treatment, and a Rutter A questionnaire was completed by the mothers. If an average of less than one wet night a week is taken as a criterion of success, then 63% of them responded in the last month of treatment; neither the Rutter score nor the maximum functional bladder capacity predicted outcome. However 26% failed to persist with treatment to the end of the project and were considered to have dropped out. If they are excluded, the initial response rate is 73%. In these cases a Rutter total score of at least 18 was found to be associated with failure to respond, but the maximum bladder capacity was not related to outcome.

The pad and bell system is effective in the management of bedwetting¹ but it has the disadvantage of requiring a good deal of effort for several weeks in order to give it a reasonable chance of success. If a patient who is likely to fail to respond can be identified in advance, his family will be saved much fruitless effort, and other procedures may have a greater chance of success.

There is a relationship between childhood psychiatric disturbance and enuresis.² There is also a well-documented association between bedwetting and a small maximum functional bladder capacity (MBC).³

The Rutter A (parent) scale⁴ provides a convenient measure of emotional disturbance in a child; it is

completed by the mother and can easily be administered in a busy paediatric clinic. The method of estimating the MBC described by Starfield⁵ is convenient to use in a hospital outpatient department. These two tests were used in an attempt to predict response to the enuresis alarm.

Methods

Selection of cases. Out of a group of 63 children referred with enuresis as the chief complaint, it was decided to manage 54 of them with the pad and bell. The remaining 9 were not treated in this way because they had previously failed to respond to an enuresis alarm, had parents who seemed incapable of co-operating, or had associated problems that required attention. No child with an active urinary infection was included.

Method. On the first outpatient clinic attendance each mother completed the Rutter A scale and the child had the MBC estimated. The child also had a physical examination and was asked to produce a midstream specimen of urine to send for culture. The mother was asked to complete a chart on the number of wet nights the child had during the next 4 weeks before the second outpatient visit. On the second attendance at the hospital the MBC was again estimated. Further charts were supplied so that the mother could again record the number of wet nights. The enuresis alarm was carefully demonstrated and supplied on loan. The mother was encouraged to assist as much as possible in its use. She returned once a month to report progress. The

criterion of a successful outcome was taken to be wetting the bed on average less than once a week during 4 weeks. A final visit was arranged after the child had responded satisfactorily, or after 5 months' treatment without a successful result. The MBC was repeated on that occasion.

Results

There were 35 boys and 19 girls. The mean age was 8.6 years (range 5–14, SD = 2.5). Fourteen patients stopped the treatment and did not have the final MBC carried out (7 boys, 7 girls, mean age 9.2 years, drop-out rate 26%); they were categorised as successes or failures but with less confidence than the 40 who persisted with the alarm.

Before starting the pad and bell, each child had wet the bed on average 20 out of a possible 28 nights. This number was reduced to a mean of 11 wet nights in the first 4 weeks of treatment. Those who failed to respond wet on average 12 nights in the last 4 weeks that they were on the pad and bell. Those who responded wet their beds less than one night on average (0.35) during the same 4-week period.

Treatment was considered successful in 34 (63%) out of the 54 cases. These 34 children were kept on the pad and bell system for an average of 16 weeks which was significantly shorter than the average length of treatment of 22 weeks for the children in whom treatment failed ($F = 8.0$, $P < 0.01$).

Rutter A (parent) scale scores and outcome. For the children who persisted with treatment ($n = 40$), a comparison between successes and failures on Rutter A scale T scores using analysis of variance, showed that the failures generally had significantly higher values (29 successes, mean 11.2, 11 failures, mean 17.2, $F = 6.3$ $P < 0.05$). There was a significant association between failure and a T score of 18 or more using the χ^2 test ($P < 0.05$); the random error coefficient of agreement⁶ also indicated a clear association ($P_1 = 0.54$). There were only 8 children with T scores of 18 or more,⁷ 3 of whom responded; this was significantly more than might be expected by chance using a one-tailed binomial test ($P = 0.02$). Rutter A scale N (neurotic) scores were significantly higher in the failures (mean = 3.5) than the successes (mean = 2.2, $F = 5.8$, $P < 0.05$). Equivalent A (antisocial) scores showed no significant differences.

If the total group of 54 cases are analysed in a similar manner, differences between high scorers and others on the Rutter A (parent) scale fail to reach statistical significance ($P > 0.05$).

Maximum functional bladder capacity and outcome. The first (mean 187 ml) and second (mean 204 ml) MBC, done 4 weeks later, correlated $r = 0.54$ ($n = 54$), which was significantly different from zero on the normal distribution ($P < 0.01$).

Successes and failures, of the cases persisting with treatment, did not differ significantly on either the first or second occasion the MBC test was carried out.

MBCs estimated just before starting treatment and afterwards (about 4 months later) showed no significant differences ($P > 0.05$) in either the successes ($t = 0.3$, mean difference = 3 ml) or the failures ($t = 1.3$, mean difference = 18 ml), even when height and weight were taken into consideration using multiple regression.

Discussion

If the view is accepted that 'active treatment cannot help those from whom it is withdrawn' and consequently the findings on the response to the pad and bell are taken 'from those who continued to take this treatment until the end of the study', which is the approach concerned with 'clinical efficacy',⁸ it would appear that Rutter A (parent) scale T scores could be used to identify a group of bedwetters who would be likely to respond to the pad and bell provided they persist with treatment. On the other hand, if it is required to know whether the same measure can predict outcome in the case of any child put on the enuresis alarm for bedwetting, the approach which has been called 'intention to treat',⁸ then the answer is clearly in the negative.

Although the results show that the MBC is an estimation that can be reliably made in a paediatric outpatient department, a previous study⁹ that suggested that a diminution in wetting can occur without the MBC showing any corresponding change, was confirmed. There was no evidence to show that the MBC is of any use in identifying poor responders.

There was nothing to suggest that the enuretic children described here were in any way atypical. If an 'expected' spontaneous remission rate of 7.5% is accepted^{10 11} during the period of the study the response rate of the cases was highly significantly better than this, on the binomial test ($P < 0.001$).

Further work is needed to find out why some families do not persist in using the pad and bell. Failure to respond was implicated in a previous study¹² but was not an obvious factor in the investigation reported here.

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Collection methods and contamination of bank milk

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SUMMARY Bank milk collected by manual expression was less likely to be contaminated than milk collected by other methods. Contamination with coliforms and gentamicin-resistant Gram-negative rods was related to the pumps used by donors in their homes. Stringent precautions reduced but did not eliminate contamination.

Bacterial contamination of human milk is a well-known cause of neonatal illness. To evaluate the risk of contamination associated with commonly used collection methods, we related the bacterial content of frozen bank milk to the method of collection.

Methods

Donors were highly motivated unpaid volunteers. Donors were asked to wash their breasts and nipples as tolerated as well as their hands before each collection. Initially, plastic breast cups (Netsy cups) were used during breast feeding to collect drips from the contralateral nipple. The cups were washed before breast feeding and the milk transferred to sterile bottles immediately after collection. All other milk was collected by manual expression, Egnell electric pump, or Loyd B hand pump (Figure);

ordinary hand pumps were not used.¹ Collection technique was rediscussed with any mother who submitted contaminated milk.

All milk was collected in the donors' homes, transported weekly from the donors' home freezer (about -20°C) to the milk bank, pooled using sterile technique, and refrozen at -20°C . A sample from each pool was diluted 10^2 , 10^4 , and 10^6 in Mueller Hinton broth and plated on to 5% sheep's blood agar and eosin-methylene blue agar. Aerobic colony counts were made after 24 and 48 hours' incubation at 36°C on blood agar and eosin-methylene blue agar. Gram-negative isolates were further screened by triple sugar iron, urea, Simmons citrate, lysine iron agars, and motility-indole-ornithine medium. Organisms other than *Pseudomonas aeruginosa* showing no activity on triple sugar iron were identified only as 'non-fermenters'. Gram-positive isolates were screened on blood agar and coagulase testing, mannitol salt agar, or optochin discs as needed. Quantitative bacterial counts were made on blood agar and methylene-blue plates. After gentamicin-resistant Gram-negative rods (GNR) had been identified in several pools, all milk was cultured on brain heart infusion plates containing $8\ \mu\text{g/ml}$ gentamicin. Any pool containing *Staphylococcus aureus*, coliforms,