

FREQUENCY OF INFECTIONS IN VARIOUS DAY CARE SETTINGS.

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In the U.S. the number of day care facilities is large and rapidly increasing. The precise frequency, nature and age-distribution of infections have not been established for various types of day care. This study was undertaken to prospectively compare these variables in children in day care centers (DC) > 7 children, family day care (FC) 2-6 children and home care (HC).

Children born at Magee Women's Hospital from Jun '85 to Apr '86 were eligible for study if their parents had decided on a type of child care and were willing to maintain a daily health calendar. Children entering FC (30) and DC (36) were matched as closely as possible with children in HC (120) for SES, sex and number of siblings. The families were telephoned every 2 weeks; the type and severity of illnesses experienced during the previous interval were recorded utilizing a standardized questionnaire. "Severe" illnesses were defined by high fever (T > 102°F, > 3 days), duration > 10 days or a physician visit.

Children have been followed for 7-16 months. The source of medical care and assessment were private practitioners in more than 90% of each group. Children in DC experienced a greater frequency (6.9 vs 3.1 days of illness/month) and more "severe" illnesses (35% vs 18%) than children in HC (p < .05) during their first year of life. Almost all infections involved the respiratory tract. Tympanostomy tube insertion was undertaken in 0.8% of children in HC, 0.0% in FC and 16.7% in DC. Continued follow-up is necessary to determine whether this pattern of infection will be maintained.

TESTING OF NEW WATER PURIFICATION TECHNOLOGY (SUPER OXIDES & CHLORINE) AGAINST E. COLI, VIBRIO CHOLERAE, SALMONELLA TYPHIMURIUM AND PSEUDOMONAS AERUGINOSA. Paul R. Williams, Daniel V. Lim, Keith S. Kanarek, University of South Florida, Department of Pediatrics and Department of Biology, Tampa, Florida.

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Safe drinking water remains one of the major health goals in the world. New technology has been developed to rapidly and inexpensively produce a superior disinfectant consisting of multiple super oxides, ozone, hydrogen peroxide and chlorine (mixed oxidants = MO). The efficiency of this product in killing various bacteria was tested. Bacteria were inoculated into flasks containing only phosphate buffered solution (PBS control) or 1:1000 dilution of MO in PBS. Samples were taken at times indicated and plated on tryptic soy agar plates to determine viable plate counts. < 10 bacteria/ml indicates no bacteria were recovered.

		< 1 minute	30 minutes	60 minutes
E. coli	Control	4700 bact/ml	3800 bact/ml	4350 bact/ml
	MO + PBS	< 10	< 10	< 10
V. cholerae	Control	24,350	15,650	20,700
	MO + PBS	< 10	< 10	< 10
S. typhimurium	Cont	35,350	35,650	35,550
	MO + PBS	< 10	< 10	< 10
P. aeruginosa	Cont	36,050	32,050	40,150
	MO + PBS	10,000	< 10	< 10

MO treatment of E. coli concentrations of 470,000/ml yielded < 10 bact/ml at < 1 minute. The data indicate MO is very bactericidal. P. aeruginosa were killed more slowly, but were effectively killed after 30 minutes. Preliminary data with viruses are also showing good killing with MO. This product may be particularly beneficial in disinfecting water in developing nations.

THE EPIDEMIOLOGY OF HIV INFECTION IN PREGNANT WOMEN AND THEIR CHILDREN Anne Willoughby, Susan Holman, Herman Mendez, Marise Berthaud, Michael Cabbad, Sheldon Landesman, James Goedert (NIH, Bethesda, MD and SUNY, Brooklyn) (Spon. Sumner Yaffe)

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The effect of HIV on pregnancy, the rate of perinatal transmission, and a description of perinatally acquired HIV infection are important aspects of the natural history of HIV. Pregnant women with a history of drug abuse were examined and followed with their children. 56 pregnant women on methadone were approached for study recruitment, with 42 women consenting to participate. 35 women have completed their pregnancies with 33 liveborn infants, 1 spontaneous and 1 induced abortion. Of the 35 women, 14 were seropositive (SP) and 21 were seronegative (SN). The SP and SN women were similar in age, ethnicity, smoking during pregnancy, gravidity, parity, education, income, and types of drugs used. Of the women who had at least 1 post-partum visit, 81% of SP and 36% of SN women have been reported to have at least 1 of the following: unexplained fevers, weight loss, sweats and/or diarrhea and/or significant adenopathy. The gestational age of children born to SP vs SN women was 37.6 vs 38.6 weeks while the birth weight of babies born to SP vs SN women was 2612 vs 2877 g. Perinatal complications in the infants were more common in those born to SP vs SN women (2.3 vs 1.5 complications/infant), more of the SP vs SN women had pregnancy complications (78 vs 41%), and the mean Apgar scores were lower in children born to SP vs SN women (6.8/7.9 vs 8.0/8.9). Of the 14 children born to SP mothers (x̄ followup=4.7 mos) 1 has died of AIDS and 2 have symptoms suggestive of HIV disease. Expansion and continued followup of this cohort will better define the natural history of HIV infection in pregnant women and their children.

HOME UTILIZATION OF INFANT APNEA MONITORS. Ann L. Wilson, Dennis C. Stevens, Rachel D. Klinghagen, Bonnie K. Becker, Lawrence J. Fenton. Univ. of S. Dakota Sch. of Med., Sioux Valley Hosp., Dept. of Peds., Sioux Falls, South Dakota.

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To investigate the home utilization of apnea monitors, 44 mothers of monitored infants were interviewed by telephone 6 to 8 weeks following discharge from a Level III NICU. Monitoring was prescribed for clinical apnea and bradycardia in 57%, for pneumogram abnormalities in 27%, and for other reasons in 16% of the sample. The infants had a mean gest. age of 32.4 ± 4.1 weeks (+ 1 SD). The mothers were asked if they "always", "sometimes", or "never" used the monitor in three situations: (1) at night, (2) during naps, (3) when the infant was out of sight. Ninety-five percent of the mothers reported "always" using the monitor at least at night. Among this group, 34% "always" use the monitor at night only, 25% "always" use it at night plus one other situation and 36% "always" use it in all three situations. Five percent reported that they do not consistently use the monitor in any situation. Chi-square analyses show no significant relationships between use of the monitor and the infant's gest. age, sex, length of hospital stay, maternal age, marital status, number of siblings, farm or city residence, reason for monitoring or socioeconomic status. Compliance with a monitor prescription is difficult to establish due to probable variation in counseling given to parents by physicians, nurses and monitor companies. However, it is clear that many parents do not maintain consistent use of home monitors at times when apnea is possible.

GASTROENTEROLOGY & NUTRITION

ANTRODUODENAL MOTOR COORDINATION IN PRETERM AND TERM INFANTS. R.P. Amarnath, C.L. Berseht, J. Perrault, J.R. Malgøelada (spons. by Gunnar B. Stickler), Department of Pediatrics and Gastroenterology Unit, Mayo Clinic, Rochester, MN

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We measured fasting antral motility and its relationship to duodenal motility in human infants, a phenomenon not previously studied. Using a previously validated pneumohydraulic manometric system (Ped. Res. 20:234A 1986), we recorded fasting antral and duodenal motility in seven preterm (30.9±1.4 wk) and two term (40.5±4.9 wk) infants. A three-hour segment was analyzed for: 1) presence of antral pressure waves (APW); 2) frequency (rate/min), amplitude (mm of Hg), and total number/hr; and 3) antroduodenal motor coordination. Motility index = log e (number of contractions X amplitude) + 1.

RESULTS: In preterm infants, the antral pressure waves occurred in clusters which did not coordinate with duodenal motility. In term infants, half of the antral motility was organized and coordinated. Characteristics of the clusters are shown (mean ± SEM):

Parameters	preterm	term
Duration of cluster (min)	5.2±0.8	7.4±0.1
Amplitude (mm of Hg)	13.2±2.1	25.9±8.7
Number of APW/hr	64.8±8.7	55.5±10.8
Frequency (rate/min)	3.5±0.3	3.0±0.1
Motility index	13.0±0.3	13.4±0.1

CONCLUSIONS: Our data suggest that antral pressure waves are present in premature infants but are not coordinated with duodenal motility; however, antral pressure waves are partially coordinated with duodenal activity by term and are associated with increasing duration and amplitude.

TAURINE TRANSPORT BY RAT JEJUNAL BRUSH BORDER MEMBRANE (BBM) VESICLES. John A Barnard, Steve Thaxter, Fayed K Ghishan, Depts. of Pediatrics, University of South Alabama Medical Center, Mobile, AL and Vanderbilt University Hospital, Nashville, TN.

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Taurine is a β-amino compound with a large number of known and putative functions. The specific mechanism by which dietary taurine is absorbed by the intestine is not known. The intestinal BBM associated taurine transport mechanism was therefore examined using rat jejunal vesicles prepared by Mg⁺⁺ precipitation. Osmotic sensitivity analysis showed that less than 5% of ³H-taurine uptake (pmoles/mg vesicle protein) resulted from binding. The initial rate (10s) of 10 μM uptake was stimulated 3.5 fold by an inwardly directed Na⁺-gradient when compared with a K⁺-gradient. The Cl⁻ salt of Na⁺ supported uptake to a significantly greater degree than did more (SCN⁻) or less (SO₄²⁻) permeant salts. Na⁺-stimulated uptake at 1 min. achieved a value 2.5 times greater than equilibrium ("overshoot"). When Na⁺-stimulated 10s uptake was examined over a range of concentrations (10-1000 μM), the relationship was curvilinear. Half-maximal uptake occurred at 25±9 μM taurine (K_m). V_{max} was 24±2 pmoles/mg protein. An inside negative, valinomycin induced, K⁺-diffusion potential stimulated 10s uptake when compared to voltage clamped conditions (4.9 vs 2.6 pmoles/mg protein; p < .05). Incubation with a structural analog, hypotaurine, reduced 10s taurine uptake by 89%.

These data support the existence of a rat jejunal BBM associated taurine transport mechanism which is Na⁺-gradient stimulated and modified by external Cl⁻, saturable, electrogenic, and inhibited by a structural analog. These features are similar to those described for the renal BBM taurine transporter.