their characteristics in digestion of fatty acid composition of mouse milk may reduce the severity of rotavirus, a non-enveloped virus, extremely interesting. We, of course, did not determine the effect of the stomach contents of infants fed the various formulas on non-enveloped viruses. Rather, our statement that milk fatty acids and monoglycerides have antiviral activity against enveloped viruses but not non-enveloped viruses was based upon the results of a number of studies by us and others showing that only enveloped viruses are inactivated by purified milk fatty acids. In the early studies of Welsh et al. enveloped Semliki Forest virus and herpes simplex virus type 1 (HSV-1) were inactivated by milk lipids but enterovirus coxsackie B4, a non-enveloped virus, was not. In addition, we found that human milk inactivated the enveloped measles virus, vesicular stomatitis virus and HSV-1 but not the non-enveloped vaccinia virus and poliovirus. Milk lipids also have been shown to inactivate dengue virus and mouse mammary tumour virus; these are both enveloped viruses.

In vitro studies it has been found that purified free fatty acids and their derivatives inactivated the enveloped Sendai virus, Newcastle disease virus, influenza A virus, Sindbis virus, West Nile virus, HSV-1 and a number of enveloped bacteriophages but not the non-enveloped SV40, polio or encephalomyocarditis viruses (ECMV). This antiviral effect appeared to be due to the destruction of viral envelopes. Several multiple findings suggest that the apparent protective effect of milk lipids against rotavirus infection observed by Daldell and Heath, to be due to the inactivation of the non-enveloped rotavirus. However, milk fatty acids may prevent the binding of rotavirus and other non-enveloped viruses to receptors or interfere with viral uncoating. These suggestions are supported by the observations of JFE Newman (Institute for Virology, Sandringham, South Africa), reported at the recent VIIIth International Congress of Virology (Berlin, 1990), that fatty acids with chain lengths of 12–15 prevent uncoating of some non-enveloped viruses, for example, bovine enterovirus and ECMV, but not others, for example, poliovirus type 1, coxsackievirus B4 and herpes simplex virus 1B and 14. It would, therefore, be interesting to see the results of an in vitro study examining the effects of medium chain fatty acids found in mouse milk on rotavirus infectivity.


6 Walsh JK, Arsenakis M, Coeien RJ, May JT. Effect of milk lipids, bovine enterovirus and human rhinovirus 1B and 14. It would, therefore, be interesting to see the results of an in vitro study examining the effects of medium chain fatty acids found in mouse milk on rotavirus infectivity.

Dr Isacs comments: I certainly agree with Professor Dodge and Dr Sagarh that milk lipids may provide important protective effects. Further evidence is required to determine the observations that alterations in the medium chain fatty acid composition of mouse milk may reduce the severity of rotavirus, a non-enveloped virus, extremely interesting. We, of course, did not determine the effect of the stomach contents of infants fed the various formulas on non-enveloped viruses. Rather, our statement that milk fatty acids and monoglycerides have antiviral activity against enveloped viruses but not non-enveloped viruses was based upon the results of a number of studies by us and others showing that only enveloped viruses are inactivated by purified milk fatty acids. In the early studies of Welsh et al. enveloped Semliki Forest virus and herpes simplex virus type 1 (HSV-1) were inactivated by milk lipids but enterovirus coxsackie B4, a non-enveloped virus, was not. In addition, we found that human milk inactivated the enveloped measles virus, vesicular stomatitis virus and HSV-1 but not the non-enveloped vaccinia virus and poliovirus. Milk lipids also have been shown to inactivate dengue virus and mouse mammary tumour virus; these are both enveloped viruses.

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Fluorescein dilaurate test of exocrine pancreatic function in cystic fibrosis

SR1—We read with interest the paper by Drs Daldell and Heath, particularly as we had a very similar study published in the Archives (four years earlier, and no references were made)! In both studies the index cases and controls were similar in age and number, but we prescribed double the dose of fluorescein dilaurate than Daldell and Heath. Our study also demonstrated significantly different fluorescein dilaurate excretion ratios between patients with cystic fibrosis and normal subjects, with the ratios being significantly reduced in patients with cystic fibrosis (p<0.01). An additional component to our study was to compare the fluorescein dilaurate test with faecal chymotrypsin estimation. We found a positive correlation between the two tests (R=0.69, p<0.02). Although the fluorescein dilaurate test appears to detect exocrine pancreatic insufficiency, in practice it is of limited value as it is in capsule form and not suitable for the age group in which the presentation of cystic fibrosis is most prevalent. We did explore the possibility of the test being used to titrate pancreatic supplement administration. If cholores-terol ester hydrolase, which is responsible for liberating the fluorescein from fluorescein dilaurate, was incorporated into a pancreatic enzyme supplement, it may be possible to use the fluorescein dilaurate test to determine the most effective dosage of pancreatic enzyme for individual patients. Unfortunately this enzyme does not appear to be present in any of the commercially available preparations.

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1 Welsh JK, Arsenakis M, Coeien RJ, May JT. Effect of milk lipids, bovine enterovirus and human rhinovirus 1B and 14. It would, therefore, be interesting to see the results of an in vitro study examining the effects of medium chain fatty acids found in mouse milk on rotavirus infectivity.


Effects of overweight on lung function

SR1—We were very interested in the paper by Dr Pung and colleagues on overweight and lung function, but we have some queries about their approach and results.

To investigate the association between body mass index and lung function in children, the authors included subjects up to 20 years of age. In table 1 they show that distribution of height for the sexes was unequal: 45% of all girls were taller than 150 cm but only 12% were taller than 159 cm. This suggests that most of these females had reached their adult height at age 13, when 75% of Hong Kong girls reach menarche, the median height is 151 cm. On the other hand, 31% of all boys were taller than 159 cm with no skewed distribution, suggesting that most boys had not reached adult height yet.


10.1136/adc.66.2.273-c
Hence, distributions of height and (matura-
tional) age of gender differ considerably and 
adjustments by linear regression cannot alter 
this: comparisons remain difficult. Secular 
trends further complicate such analyses.1 2 
Because the height-lung function relationship 
during puberty is complex and varies with 
age and gender, 3 4 it is desirable to study the 
sexes before and after attaining adult height.

A contribution of body mass index to lung 
function may biologically relate to trunk size 
rather than fat distribution. Schwartz et al 
found correlations between body mass index 
and sitting height and concluded that sex 
related differences in lung function partly 
explained by body height of the trunk. 3 4 
Increased chest circumference and biacromial 
width correlate—independently of stature—with 
body mass index (r = 0.80 and 0.55, in 995 
girls, R Veeneklaas, personal communica-
tion).

Explain ed variance is improved by body 
mass index but it is unclear if this holds 
equally for the full age range studied, and it 
seems particularly to occur in the heaviest of 
the trunk. 3 4 The observed relationship 
implicates that body mass has a positive 
effect on lung function in girls and in 
normal weight boys.

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Circulating malignant cells in Burkitt's 
lymphoma: possible role in tumour 
dissemination

Sir,—The tumour, Burkitt's lymphoma, 
arises as a clonal proliferation. In any indi-
vidual patient the surface membrane im-
munoglobulin of the malignant cells has 
different heavy and light chains. 1 It is usual 
at presentation for such patients to have multiple 
organ involvement. Necropsy studies have 
demonstrated multiple organ involvement in 
both African and non-African series. 2 3 
Previous explanations for the widespread metastas-
ises have been principally that the tumour cells 
spread through anatomical channels and tissue 
layers, but it was not easy to explain metastasis 
to the breast and thyroid via such routes. 4

Circulating malignant cells can be identified 
in 25-50% of patients with Burkitt's lymphoma 
who have bone marrow involvement. 5 By examining at least three buffy coat 
smears stained routinely with Leishman's dye 6 we were able to detect malignant 
cells in the peripheral blood of 19 out of 25 patients in our 
centre who did not have bone marrow involve-
ment. It is essential to obtain samples before 
chemotherapy because of the tumour's 
response to cytotoxic agents. We believe that 
multiple organ involvement in Burkitt's lym-
phoma results from deposition of circulating 
malignant cells within tissues. Such haemato-
genous spread can account for tumour masses 
in apparently aberrant sites.

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An emotional trigger mechanism for sudden 
infant death

Sir,—In their study of recurrent cyanotic epi-
sodes Southall et al suggest that the most 
common trigger was a sudden, naturally 
occurring stimulus from fear, anger, or pain.1 
Examples of 'surprise' and 'unpredictability' were 
stressed. Cyanotic episodes were more common 
when there was a high level of emotional ten-
ton in the home, or when the routine of the 
child was interrupted.2

These observations lend strong support to 
the 'fear paralysis' hypothesis proposed from 
1986 as a trigger mechanism for SIDS.2 3 
adding emotional/psychical factors to the list 
of theories attempting to explain the cause of 
sudden infant death syndrome (SIDS). 
This innate, arctic reflex, present throughout 
the entire animal kingdom, precipitates cardiovas-
cular and respiratory changes, which in an-
imals may lead to death. The stimulus for 
the fear paralysis reflex is any threat perceived 
as a danger and which evokes fear, such as pre-
dator confrontation, restraint of movement 
(preventing flight), unfamiliar and sudden 
noises. The reflex is strengthened in a strange 
environment, in separation from the mother 
and companions, and in situations with which 
the organism is unable to cope. Elements of 
surprise, unexpectedness, and novelty were 
similarly emphasised. On the response side, characteristic features of the 
fear paralysis reflex are an immediate motor 
'paralysis' which includes generalised 
and prolonged immobility, reduced muscular 
tone, bradycardia, and unresponsiveness to 
external stimulation. The response pattern 
feature includes a brief (20-30 second) arrest of respiration in expiration, and 
continues in systemic and pulmonary arterial 
pressure—that is, the same changes that 
are held responsible for the hypoxaemic and 
cyanotic episodes and SIDS in susceptible infants. 
Emotional responses as well as apnoeic epi-
dodes may show both primary increases and 
decreases in heart rate. 

A further similarity between the fear para-
lysis reflex and the cyanotic episodes refers to 
their response to pharmacological agents. In 
animal experiments, fear paralysis was sup-
pressed by clonidine and other alpha 
agonists,2 4 and these were proposed as a preven-
tive means in infants at high risk for SIDS.2 
Southall et al have now demonstrated that 
such treatment with clonidine and tetraben-
zine is effective.

In support of the fear paralysis reflex as an 
extrinsic trigger mechanism for SIDS is the 
observation that restraint of movement 
was considered a contributing factor to death in 
as many as every third case of SIDS.4 Further, 
the excess of SIDS during weekends and 
holidays can only be explained by the operation 
of environmental trigger mechanisms.5 Finally, 
Southall et al observed that at least 90% of 
the deaths happened during sleep. This 
emphasises the infant's daily rhythm and/or sleep-
ing rhythm before death or the apnoeic 
episode in about 40% of the cases.6

BOOK REVIEWS

Yearbook of Pediatrics 1990. Edited by FA 
Oski, JA Stockman III. (Pp 527; price not 
noted, hardback.) Yearbook Medical 

This is the eleventh time that Professors Oski 
and Stockman have collaborated in the editing 
of the yearbook. Neither shows any sign of 
flagging and the commentaries are as lively 
and stimulating as ever. The format is 
similar to previous editions except for the 
deletion of the synopsis of review articles. Key 
publications have been abstracted from a wide 
range of journals of English speaking nation-
als.

In his foreword Professor Oski describes, 
examples, with the scope of the contents, how 
society and its problems touch on paediatrics 
(AIDS, maternal drug abuse, war, contractual 
illness, new diseases (human parvovirus and 
pertussis infections), new therapies (heart-
lung transplantation for cystic fibrosis, laser 
treatment for naevi) and new signs (the closed 
eye sign in abdominal pain, the perina al 
rupture in Kawasaki disease). For general