

TABLE I—Relationship of Disease with Immunization Status

Study	Total cases	BCG immunized	Unimmunized
Mathur <i>et al.</i>	530	86 (16.2%)	444 (63.8%)
Tidjani <i>et al.</i>	175	62 (35.4%)	113 (64.6%)

reported development of tuberculosis in 7.1% of BCG vaccinated children(2). The relationship of disease with immunization status revealed that in both the studies(1,2) tuberculosis occurred after BCG immunization, more so in Tidjani *et al.* study(2) (Table).

The recovery and mortality rates were 44.2 and 27.0%, respectively in BCG immunized patients as compared to unimmunized patients which were 51.0 and 24.1% indicating that efficacy of BCG vaccination in children was doubtful.

Therefore, it will be justified to say that BCG vaccination was the only factor causing increased mortality in immunized cases as compared to unimmunized cases. This is due to the fact that after BCG the suspicion and diagnosis of tuberculosis is difficult.

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Use of Medicines in Pediatric Practice: Tablets vs Liquids

Liquid medicines have been widely used in pediatric practice because of some industrial promotion of subtle advantages like being tasty, ready to use. But there are many disadvantages which each one of us should keep in mind before a prescription is written. Rightly, some authors have questioned the use of liquid medicines(1).

Disadvantages of Liquids

1. *High Cost:* Cost of liquid medicines is 20 to 800% higher than the tablets (Table I). For example if a one-year-old child suffering from acute invasive diarrhea is to be treated with nalidixic acid, cost difference is Rs 10. Similarly, if a 12 kg child of 2 years with acute pharyngitis to be treated for 10 days with penicillin and paracetamol cost difference would be about Rs 20. In case cotrimoxazole and paracetamol is used for 5 days, cost difference would be about Rs. 12.

The average cost difference per prescription is Rs 10. If 5500 members of IAP change their mind in one patient per day; patients money saved would be about Rs 2 crores per annum which is equivalent to 25 times of annual subscription of all IAP members.

2. *Less Stability:* Chemical instability of a drug is invariably magnified in solution

TABLE I—Comparison of Cost Between Tablets and Liquids

Medicine	Qty.	Cost (Rs)		% more for liq.
		Tab	Liq.	
1. Penicillin (Crystapen-Allenburys)	4 lac units	1.00	2.10	110
2. Erythromycin (Althrocin-Alembic)	250 mg	2.70	3.40	25
3. Ampicillin (Roscollin-Ranbaxy)	250 mg	1.45	2.10	45
4. Chloramphenicol (Chloromycetin-Parke Davis)	250 mg	0.85	1.40	65
5. Cotrimoxazole (Bactrim-Roche)	TMP 40 mg SMX 200 mg	0.45	0.85	100
6. Paracetamol (Calpol-Wellcome)	500 mg	0.25	1.95	800
7. Furazolidone (Furoxone-Eskayef)	100 mg	0.23	1.25	500
8. Nalidixic Acid (Gramoneg-Ranbaxy)	500 mg	2.90	4.00	40
9. Betamethasone (Betnesol-Glaxo)	0.5 mg	0.30	0.45	50
10. Nitrofurantoin (Furadantin-Eskaypharma)	100 mg	0.40	1.80	450
11. Isoniazid (Isokin-Warner)	100 mg	0.06	0.27	450
12. Rifampicin (Rimpin-Lyka)	150 mg	1.45	1.75	20
13. Metronidazole (Flagyl-Rhone Poulenc)	200 mg	0.36	1.10	300
14. Vitamin C (Sorvicin-East India)	500 mg	0.50	2.20	450
15. Chloroquin (Lariago-IPCA)	150 mg	0.55	1.65	300
16. Salbutamol (Asthalin-Cipla)	2 mg	0.33	0.50	35
17. Cyproheptidine (Ciplactin-Cipla)	4 mg	0.27	1.00	400
18. Piperazine (Wellcome)	500 mg	0.25	0.52	100
19. Pseudoephedrine (Sudafed-Wellcome)	60 mg	0.35	1.00	200
20. Carbamazepine (Tegretol-Ciba Giegy)	200 mg	1.70	2.40	40
21. Mebendazole (Mebex-Cipla)	100 mg	1.04	1.30	25

Source: MIMS India, February, 1991, New Delhi.

form as opposed to solids. Increased microbial growth, evaporation of solvent, adsorption of colors and flavors contribute to this. It reduces the shelf life(2).

3. *Unwanted Colored Agents:* These have only aesthetic and no pharmaceutical value(2). These are put in almost every liquid and can cause allergic reactions and hence can be a health hazard.

4. *Accurate Measures:* On a survey of 3 chemist shops it was found that only 15-

20% liquid medicines had appropriate measures. Home teaspoon measures have been shown to vary from 2.6 to 5.45 ml(1). This will lead to widespread inaccuracies in dosage.

5. *Alcohol or Chloroform in Liquids:* Alcohols (0.5 to 1%) and phenols (0.05 to 0.2%) have been recommended for preservation of liquid medicines(2). In higher concentrations it can be harmful to young infants and children causing

incompatibilities and disulfiram type reactions(3). Still it is present in large volumes in many liquids varying from 5 to 25% v/v. For example some paracetamols (Crocin and Pyrigesic) have 10%, theophyllines (Bronchodil and Choliphyllin) 20%, cough syrups 5 to 11%, general tonics, iron liquids, B complex liquids, cyproheptidines contain 5 to 25% alcohol. Obviously, the amount of alcohol is too high. Chloroform can cause liver damage and is present in many cough syrups and expectorants.

6. *Wastage*: A bottle of liquid once opened if not tolerated is discontinued and thrown away. It is lot of economic wastage as opposed to tablets which can be stored.

A trial of acceptability was conducted in our hospital on 20 patients under 1 year in each group with crushed tablets or opened capsule made into pulvs. Sugar coated iron tablets were tried in children above 4 years by swallowing. If the child swallowed this pulv dissolved in water and did not vomit within half an hour it was considered acceptable. Results were quite encouraging (Table II).

In conclusion it can be safely said that tablets are quite cheap, stable, can be easily given to young children in crushed form and acceptability is quite good even in a neonate. After all what do we do with drugs like lasix, lanoxin, aspirin, phenobarbitone, prednisolone which are not available in liquid forms? It is good now we see more and more drugs in dispersible tablet form.

However, necessity of having liquid medicines rests with castor oil and liquid paraffin(4). Antacids are better if given in liquid form.

Pediatricians and family physicians are requested to prescribe tablet form of medi-

TABLE II—Acceptability of Tablet Form of Medicines

Drug	Acceptance (%)
1. Paracetamol	90
2. Penicillin	90
3. Erythromycin Estolate	100
4. Salbutamol	100
5. Theophylline	65
6. Isoniazid	100
7. Cotrimoxazole	100
8. Rifampicin	100
9. Furazolidone	90
10. Nalidixic Acid	100
11. Cyproheptidine	100
12. Piperazine	90
13. Betamethasone	100
14. B-complex	100
15. Pseudoephedrine	50
16. Chloroquin	50
17. Carbamazepine	100
18. Phenobarbitone	100
19. Iron (sugar coated) by swallowing in above 4 years of age	80

cines to children and avoid use of liquids to give them an economic and pharmaceutical advantage.

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Agensis of Frontal Bone

Developmental defects of the skull are rarely seen. They are usually without clinical sequelae yet at times associated with intracranial pathology incompatible with life(1). We report a case of frontal bone agensis.

This was a five-year-old male child presenting in outdoor with pulpiness of the

front of the skull since birth. There was no contributory point in antenatal history and delivery. Subsequent milestones were also normal. Examination revealed loss of frontal bossing and the whole forehead area was pulpy. Head circumference and chest circumference were 49.5 and 53.0 cm, respectively. The child was normal otherwise and did not show any sign of growth or developmental retardation. There was no neurological deficit. X-ray skull revealed agensis of frontal bone (Fig.).

Frontal bone constantly develops from two symmetrical halves(2). It is invariably agreed that ossification of frontal bone takes place from two primary centres which appear in the membrane between 40th and 50th day of intra-uterine life(2). They are sited in the position of the future frontal eminences. Failure of these ossification centres to develop probably accounts for the agensis of the whole



Fig. X-ray skull showing agensis of the frontal bone. Primary centre of ossification has developed on the right side (arrow mark) but not on left side. There is complete absence of primary and secondary tuberculosis on both sides.