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EVIDENCE BASED AYURVEDA

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INTRODUCTION

Ayurveda, the science of life, elucidated in India over 6,000 years ago was the first record of scientific medicine in the history of the world. The word "Ayurveda" literally means knowledge (*Veda*) of life (*Ayu*). The aims of Ayurveda are both to improve the quality of life and increase its span. Its major emphasis is on prevention of disease and promotion of health by strengthening tissues so that they can withstand exogenous and endogenous stressors. This is achieved by modulating diet and lifestyle, as well as by the appropriate use of drugs and therapeutic maneuvers like "*Panchakarma*" that restore the equilibrium of the body.

Unfortunately, all the information is in Sanskrit, the classical language of India, which is not easy to interpret. The Moghul and British invasions did not allow either the language or the knowledge to flourish. Consequently, the beneficial effects of the therapies described in Ayurveda have not been meaningfully interpreted in modern scientific language nor have they been subjected to verification by rigorous experimental or clinical methodology.

Very few Ayurvedic therapies have been subjected to evaluation keeping the principles of Ayurveda as the basis for choice of therapy.

In this era of evidence based medicine, it is important to generate data that will support decisions to use Ayurveda in the mainstream of healthcare. Our center has been involved in validating the Ayurvedic concepts of health, disease and treatment for a number of years. We have concentrated on areas where satisfactory treatment is not available in modern medicine. We have also been evaluating the potential of Ayurvedic remedies as adjuvants to counteract side effects of modern therapy and have compared the cost effectiveness of certain Ayurvedic therapies *vis a vis* Modern therapeutic schedules.

In this article, we discuss briefly some of our studies that have suggested that Ayurveda may play an important role in modern health care. These include the concept of *rasayana*, *ksharasootra*, treatment of hemorrhoids and use of *vaman* (forced emesis) in bronchial asthma.

CONCEPT OF RASAYANA

The concept of *rasayana* interested us as the claims for this form of therapy are far reaching. In the words of Charaka, "one obtains longevity, regains youth,

gets a sharp memory and intellect and freedom from diseases, gets a lustrous complexion and strength of a horse" (Charaka Samhita). Several plants are

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described as having general *rasayana* properties. Moreover, specific rasayanas are described to strengthen specific tissues or organs in an individual.

The term *rasayana* has been split up into *rasa* and

ayana meaning the path that *rasa* takes. This improves the quality of the *rasadhatu*, and improves the quality of other tissues as well as of the other regulators of health like and *doshas* and *mala*, leading to a state of positive health.

QUERIES

This information on *rasayanas* raised some questions. How was it possible for one plant, with its usual array of phytochemicals, to produce a variety of effects such as delayed aging, improved mental function and freedom from several diseases, including those caused by infection? If specific

rasayanas are used to strengthen specific tissues, would they have any organ selectivity as described in Ayurveda? How did one *rasayana* plant differ from the other? Were there any clues to the pharmacokinetics of the plant?

INTERPRETATION AND HYPOTHESIS

The most likely hypothesis explaining the apparently diverse actions of *rasayanas* was that the plants were modulating an endogenous system of the body, setting into motion a cascade of events leading to the multiple effects.

With the burgeoning knowledge from the field of psychoneuro-immunology as a frame of reference, we devised experiments to attempt to prove this

hypothesis. The immune system has connections to a number of other organs and can directly or indirectly influence the actions of many others, including the brain. By acting primarily on the components of the immune system, such as the macrophages, and activating the cytokine network, the simple chemical in the herbs could produce all the actions that have attributed to them.

PLANTS STUDIED

Six *rasayana* plants were selected for study: *Emblica officinalis* (EO, *Amla*), *Tinospora cordifolia* (TC, *Guduchi*), *Asparagus racemosus* (AR, *Shatavari*), *Withania somnifera* (WS, *Ashwagandha*), *Terminalia chebula* (TCh, *Haritaki*) and *Piper longum* (PL, *Pimpli*). These were selected from a large number of *rasayanas* because they were specified to be “*ekdravya*”. i.e. they can be given as single entities. We first followed Ayurveda’s strictures as to the part and formulation to be used to verify the concept of *rasayana*, and only then pursued the phytochemical aspects of the plant.

DOSE AND DURATION

A dose of 100 mg/kg was selected for initial studies based on LD₅₀ data. All plants were administered

orally as total aqueous extracts for 7 to 15 days.

1. INDUCED INFECTIONS

The first set of experiments was performed to test the efficacy of rasayanas against infections induced both in normal animals (by caecal ligation or by inducing peritonitis with *E.coli*) and in animals that have been immunosuppressed. Pretreatment with all *rasayanas* was effective in protecting animals to a varying degree from different infections.

In the model of mixed infection produced by caecal ligation in rats, untreated animals showed a mortality rate of 85% by the fifth day after surgery. Animals treated with AR had a mortality rate of 26% (p<0.05). Pretreatment with TC reduced the mortality to 33%,

comparable to those treated with a regimen combining gentamicin with metronidazole. When TC was combined with gentamicin and metronidazole mortality fell to 16.6% ($P < 0.05$).

In another set of experiments, we found that pretreatment of mice with AR ($p = 0.002$) and TC ($p = 0.0004$) significantly reduced mortality induced by *E. coli* peritonitis. Bacterial clearance was hastened in the TC-treated mice compared to the control and was associated with activation of polymorpho nuclear (PMN) phagocytosis.

Similar protection was found against *E. coli* infection in cholestatic rats with significant immunosuppression. When *S. aureus* infection was induced in neutropenic mice, AR and TC reduced mortality to 50% and WS to 30% as compared to 75% in control mice. Further, in *K. pneumoniae* sepsis induced in neutropenic mice, all control mice died, and all gentamicin treated mice survived ($p = 0.0005$). The survival rate for mice treated with TC was 70% ($p = 0.0005$).

Neutropenic mice showed 42% mortality when treated with TC ($p = 0.009$) as compared to 86% in control mice when fungal infection was induced with intravenous injection of *C. albicans*. In the same experimental protocol, animals given fluconazole were similarly protected (40% mortality; $p = 0.009$). When TC was given in addition to fluconazole, the mortality fell further to 30% ($p = 0.001$).

Mice immunosuppressed by hemisplenectomy were infected with either *E. coli* or *S. aureus*. While the control animals had a mortality of 100%, none of the TC-treated mice died in the *E. coli* model ($p = 0.0005$) and only 20% died ($p = 0.001$) in the *S. aureus* model.

Surgical stress induced by the handling of visceral organs during a laprotomy also produces immunosuppression. Intravenous injection of *C. albicans* led to 58% mortality in control mice; this was reduced to 14% in the TC-treated mice

($p = 0.06$).

2. IMMUNOMOULATORY EFFECTS

The experiments performed so far indicated that the *rasayanas* protected animals against infections. The mechanism appeared to be mediated through an immunostimulant effect rather than antibacterial action. This was confirmed by doing *in vitro* antimicrobial studies. In order to prove that AR, TC and WS had immunomodulatory effects, their protective effect against the myelosuppressive effects of cyclophosphamide (CP) was tested in mice. We found that pre-treatment with all the three drugs induced a significant leucocytosis ($p < 0.001$ compared to control) with predominant neutrophilia ($p = 0.0001$) and abolished neutropenia produced by a single dose of CP. This compared well with glucan and lithium carbonate.

PMN functions, in terms of phagocytosis and intracellular killing, were stimulated in animals treated with the *rasayanas* as compared to control animals in all experiments.

Carbon clearance improved with treatment with the plants: the half-life of carbon particles decreased from 37.69 ± 5.56 mins to 25.24 ± 0.65 mins with TC ($p < 0.001$), to 17.8 ± 11.52 mins with AR ($p < 0.01$) and to 11.2 mins with EO indicating that the RES as greatly activated and further proving that *rasayanas* are immunostimulatory. The phagocytic functions of peritoneal and alveolar macrophages were also stimulated with TC, AR and EO.

3. EFFICACY AGAINST COLD IMMOBILIZATION STRESS

Cold-immobilization stress increased Evan's Blue leakage into gastric tissue and gastric contents indicating gastric vascular mucosal damage. Pre-treatment with all three *rasayanas* reduced leakage significantly. Similarly, the stress induced rise in plasma steroids and suppression of peritoneal macrophage functions was blunted.

4. ORGAN SELECTIVITY

The organ preference of *rasayanas* was investigated by exploring the effects of different *rasayanas* on different organs. Ancient compendia mention selective affinity of a plant for a particular organ and advocate its use in dysfunction of that organ e.g. *Tinospora cordifolia* is prescribed for the liver, *Emblica officinalis* for the gut, especially for the pancreas, *Asparagus racemosus* for the stomach and *Piper longum* for the lungs. This selectivity was confirmed in different experimental models (TC and liver; EO and pancreas, AR and the stomach and PL and the lungs).

5. CONCEPT OF VIPAKA

Ayurveda describes the pharmacology of drugs in some detail. One concept described in Ayurveda is *vipaka*. Plants have different actions depending on the *vipaka* they produce.

The *vipaka* can be put into three general categories according to its taste, i.e. *madhur* (sweet), *katu* (Pungent) and *amla* (sour). The *rasayanas* produce two types of *vipaka*: *madhur* (sweet) and *katu* (pungent). We compared the effects of *rasayanas* having these two types of *vipaka* on carbon clearance in rats. We found that only those *rasayanas* that produced *madhur vipaka* like *Tinospora cordifolia*, *Asparagus racemosus*, *Emblica officinalis*, *Terminalia chebula*, *Bacopa moniera* and *Withania somnifera* improved the carbon clearance, indicating stimulation of the reticuloendothelial system. On the other hand *rasayanas* like *Acorus calamus*, *Commiphora mukul* and *Picrorrhiza kurroa* with *Katu vipaka* either did not activate the RES or prolonged carbon clearance, suggesting immunosuppression.

Further, *non-rasayana* plants with *madhur vipaka* like *Hemidesmus indicus* or *Tribulus terrestris* or *non-rasayanas* with *katu vipaka* like *Embelia ribes* or *Curcuma longa* did not hasten carbon clearance.

6. MECHANISM OF ACTION OF RASAYANAS

In an attempt to investigate the mechanism of action of one of the *rasayanas* i.e. TC, we studied the proliferative fraction of the bone marrow of mice by flow cytometry. We found that compared with normal mice, there was a significant increase in the proliferative fraction in the bone marrow in mice treated with the TC.

Some *rasayanas* activate mononuclear cells to produce cytokines like GM-CSF and IL-1 in a dose dependent manner.

These results indicate it is possible that the *rasayanas* (particularly those with *madhur vipaka* that are advocated as adaptogens in Ayurveda) primarily activate immune cells, leading to secretion of cytokines, which in turn act on multiple target organs to produce the myriad effects ascribed to these treatments. Our experimental work continues in this direction, in an attempt to demonstrate conclusively the intricate set of events that are set into motion when a *rasayana* plant is used.

CLINICAL STUDIES

While we were conducting these experiments, we performed clinical studies using a formulation of the aqueous extract of one of the *rasayanas*, namely *Tinospora cordifolia*, in immunosuppressed patients. This was standardized and characterized to give a reproducible HPLC pattern. A 500 mg tablet was made and administered three times a day.

Clinical studies were conducted after obtaining approval of the Ethics Committee of our institute. The safety and tolerability of the formulation were confirmed in human volunteers.

We found benefits in obstructive jaundice, amelioration of side effects of chemotherapy and hastened recovery from tuberculosis.

TC AND APOPTOSIS

In the earlier flow cytometry studies we found that high doses of TC led to apoptosis in bone marrow cells. We did further experiments to confirm this. Five groups of mice (n=6 each) were studied. They included control animals, mice given TC 200 mg/kg/d for 7 days, mice given TC 400 mg/kg for 7 days, mice given TC 200 mg/kg for 7 days followed by a single dose (200 mg/kg subcutaneous) of cyclophosphamide (CP), and mice given only cyclophosphamide (200 mg/kg subcutaneous). The bone marrow cells were stained with acridine orange and studied under a fluorescent microscope on the seventh day of therapy in the animals given TC alone and on the 3rd day after the administration of CP in the mice given CP after TC.

In the control mice, the apoptotic index was $18.88 \pm 6.76\%$. It remained unaffected in the mice given TC 200 mg/kg ($21.33 \pm 8.42\%$). The apoptotic index was significantly ($p < 0.01$) increased at 400 mg/kg TC ($38.39 \pm 12.29\%$). CP also increased apoptosis ($37.5 \pm 18.11\%$, $p < 0.05$). On the other hand, when

200 mg/kg TC was given before CP, the apoptosis was reduced ($18.79 \pm 4.38\%$, $p < 0.05$). This probably explains the protective effect of TC against CP neutropenia.

The pharmacological profile of TC suggested its utility as an adjuvant in cancer patients. As it increased apoptosis in high doses, it was of interest to find out what effect the drug had on malignant cells. For this we chose the model of mice with ascitic tumors induced with S-180 cells. The mice were injected intraperitoneally and the apoptotic index studied in ascitic aspirate cells. Surprisingly, the therapeutic dose of TC (200 mg/kg for 7 days) increased the apoptotic index ($4.48 \pm 2.11\%$ as compared to control $1.337 \pm 1.94\%$, $p < 0.05$) in the peritoneal cells.

We could conclude from these experiments that at therapeutic doses (100-200 mg/kg), TC-induced apoptosis in malignant cells, but protected the normal bone marrow from apoptosis induced by cyclophosphamide.

OTHER AYURVEDIC THERAPIES

Certain Ayurvedic therapies have been evaluated for conditions like fistula-in-ano, piles and asthma.

Kshara sootra

This Ayurvedic medicated thread is used in the management of fistula-in-ano. Dr. Bapat and his team were involved in a multicentric, randomized, controlled trial in 502 patients conducted by the Indian Council of Medical Research on the efficacy of *kshara-sootra* in management of fistula-in-ano. The trial showed that the long-term outcome was better with *Kshara-sootra* than following surgery. However, some side effects were noted, such as burning pain and discharge for 48 hours.

In a further investigation intravenous anaesthesia was used to apply the *kshara-sootra* into the fistula, along with local application of glycerine-magnesium

sulfate solution to reduce local edema and pain, use of herbal laxatives and use of local herbal ointments. This modification was found to be an effective technique, ideal for the patient as well as the surgeon, useful for all types of fistulae. Morbidity was minimal. The procedure did not require a stay in the hospital and the patient did not have to lose working days. This would have a great impact on health economics.

Hemorrhoids

The efficacy of ayurvedic therapy in the management of hemorrhoids has also been confirmed. Treatment with herbal medications (systemic and local) was curative with less chance of a recurrence, and could be used in third-degree hemorrhoids. Thus, in cases where surgical correction is contraindicated,

Ayurvedic therapy has a definite role to play. It reduces the morbidity and the cost remarkably.

Vaman

Yet another example of how Ayurvedic and modern therapies can be combined for better patient care is *Panchakarma*, which includes certain procedures to establish homeostasis.

Vaman is one of the *Panchakarmas* which is used in Ayurveda for the treatment of asthma. *Vaman* is “forced emesis” and is thought to relieve the blockage of channels in the respiratory system. Plants like *Acorus calamus* and *Glycerrhiza glabra* and used to induce *vaman*.

In an open prospective trial, 10 patients with bronchial asthma of more than five years duration, who had been uncontrolled with optimal treatment for more than two years were recruited. Symptom score, drug score and pulmonary function tests were assessed before and after *vaman*. After *vaman*, the symptoms improved significantly. This improvement persisted for eight weeks. The requirement of drugs was reduced. The ratio of forced expiratory volume (FEV) to forced ventilatory capacity (FVC%) and PEFr showed improvement at the end of two weeks and persisted till the end of observation period.

From all these facts, it becomes evident that Evidence based Ayurveda is not a dream, but a reality. Ayurvedic therapies, particularly the plants it prescribes, have a very important role in modern health care.

Unfortunately, today Ayurveda is not practiced in the way it should be, *i.e.* in accordance with all its principles. This is particularly true for plant drugs. Today they are available as either Ayurvedic formulations or as brand-name products. The brand-name products are available as ethical as well as over-the-counter products. Often they are self

These results suggest that tolerance to β -stimulants was reduced, which reflects restoration of the airway responsiveness. Thus, a rational combination between two systems can improve patient care.

Leech therapy

The effectiveness of medicinal leech therapy was evaluated in producing venous decongestion, reversal of oedema, hyperpigmentation and healing of varicose ulcer(s). Medicinal leech was applied to the area surrounding the varicose ulcer(s) in 20 patients with varicose veins with complications and the patients monitored for ulcer healing, and decrease in hyperpigmentation, oedema and limb girth. The partial pressure of O_2 (pO_2) of 7 patients’ arterial and venous blood was compared to that sucked by the leech. After leech therapy all the ulcers showed healing, while 95 per cent of patients showed a decrease in oedema and limb girth. Seventy five per cent patients demonstrated a decrease in hyperpigmentation. The mean pO_2 of blood sucked by the leech was 40.05 +/- 7.24 mmHg, which was similar to the mean pO_2 of the patients’ venous blood (34.33 +/- 8.4 mmHg). This study confirmed for the first time that the medicinal leech sucks venous blood and aids ulcer healing, and can probably therefore be used as an effective adjunct in the management of complicated varicose veins.

CAUTIONS

prescribed. A very firm conviction in the patient’s mind is that Ayurvedic drugs are safe. Unfortunately, safety is presumed, not proven. Ayurveda by no means propounds that all drugs are safe.

In fact, untoward effects like giddiness, and even death and fetal abnormalities have been described. Adverse effects due to chronic administration have also been described, and contraindications are given.

Ayurveda has described intricate procedures known as *shodhana* for processing potentially toxic substances. In our studies we have shown that *samskaras* (procedures) can detoxify toxic

substances like aconite but have to be carried out in their totality.

Adverse drug reaction (ADR) monitoring must be done for Ayurvedic drugs just as is done for modern drugs. With this in mind, an ADR monitoring cell has been established at the Ayurveda Research Centre. Apart from ADR monitoring, the cell carries

out surveys on pattern of drug usage and collects data for interaction with modern drugs.

Sufficient unbiased objective scientific documentation will allow the development of a database to confirm the evidence base in Ayurveda and allow it to be practised in its truly pristine form, safely and effectively.

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EARLY INTERVENTION AND STIMULATION PROGRAMS

Dr. Suchit Tamboli*

INTRODUCTION

Now a days small family norm has created an awareness in parents about child development and what best they can offer to their children; they are ready to do everything possible. They need to be guided in proper manner and in scientific way. Many of the pediatricians are not interested in Developmental pediatrics because it is time consuming and least economical branch. But this branch is gaining rapid popularity time parents and pediatricians need to know how they can handle such cases in their clinic with some knowledge and in -

practice training in less time. I will be dealing with

- 1} what is high risk infant who needs stimulation program? How can we detect it?
- 2} What are the tests available to screen or test in detail the patient?
- 3} What are the Indian stimulation programs available? Their content and availability, pros and cons/advantages and disadvantages of each program.

WHY EARLY STIMULATION

As all us known that 80–90% of brain development occurs in first 2.5 years and about 95–99% by 6 years. 80% of intellectual development takes place in first 8 years. We must catch ‘sensitive’ and ‘critical’ period of learning during which heightened sensitivity to stimulation or deprivation may have lasting or irreversible effects. This period has not only been proved to be critical but also crucial in human being. Each child needs an experientially rich environment for his/her optimum development. Children do not need rich stimulation programs of Rs. 75,000/- and above like word book but need a home in which the child gets an opportunity to listen to good stories, to play with varieties of objects, handle them and sing with adults. A home which believes in the capacities of the child and has high hopes for him / her is the best stimulator. Each parent although he/she may be illiterate can provide stimulation to one’s own child starting immediately after birth.

What mother can do immediately after birth

(Dr. Tamboli’s **WHO accepted stimulation program-tech. report series)**

- 1) Mother should talk to baby by looking into her eyes.
- 2) Baby should listen to music of Tape / Radio / T.V. 3–4 hours per day. Rhythmic music has more role.
- 3) Baby should play with the rattle and hanging colorful toys.

Such type of simple but scientific programs with consideration given to our culture has been prepared and are available in various Indian languages.

HIGH RISK NEW BORN [N. N. F. criterion]

- 1) B. W. < 2 kg.
- 2) Asphyxia - Did not cry for 15 min after birth
- 3) Hypotonia - loseness, limpness, floppiness in body

* Consulting Neonatologist & Paediatrician, Ghamare Lane, Azad Chowk, Ahmednagar

- 4) Feeding difficulties - not sucking well in first 2 days
- 5) Respiratory distress within first 2 days
- 6) Jaundice within first 2 days / kernicterus / those who required exchange transfusion.
- 7) Neonatal seizures especially due to hypoglycemia or other seizures. Such a baby also has to be put on stimulation programs.

HIGH RISK IDENTIFICATION BY DOCTOR

- i) Prenatal :-** i) Rubella ii) Ante Partum Hemorrhage iii) Diabetes iv) Thyrotoxicosis v) PET.
- ii) Neurodevelopmental assessment by Amiel Tieson Method**
- Amiel Tison has incorporated many of these ideas and has provided us with a comprehensive system of neurological evaluation in the first years of life. This system makes a lot of sense, because it also gives us a frame work for instituting physical therapy program. Transient abnormalities can also be a predictor for later scholastic problems. We can detect transient abnormalities and persistent abnormalities and treat them accordingly.
- Self Training Video Cassette is available at London University which costs around Rs. 5000/- This is very helpful and simple procedure for neurodevelopment assessment.
- ii) Developmental Screening**
- Defined as "Identification among apparently healthy individuals of those who are sufficiently at risk of a specific disorder to justify a subsequent diagnostic test or procedure or in certain circumstances direct preventive action."
- iii) Genetic :-** Family H/O i) Major illness ii) Mental subnormality or LD iii) Sensorineural deafness iv) Blindness, squint etc.
- iv) Social :-** i) Mother > 40 years or < 18 years ii) Poor socioeconomic iii) Poor Housing, overcrowding, Single parent, dysmorphic baby.

After identification of High Risk Baby doctor should keep baby immediately on stimulation programs with developmental assessment and close monitoring is required.

MONITORING IS DONE AS FOLLOWS:

- i) Growth and nutrition by Anthropometry**
Wt., Ht., Head and Chest Circumference, Upper segment, Lower segment etc.

* **Screening Tests Available are :-**

0-3 years	3-15 years
1. Baroda Infant Screening Test (BDST)	1. Goddard Farm Board Test (3-5 years)
2. I.C.M.R. scale	2. Draw a man test (can be used in large camps) (4 - 15 years)
3. D.D.S.T. (Denver scale)	
4. T.D.S.T. (Trivendrum Development Screening Test)	

These screening tests require 5 -10 minutes and Interpretation is also very easy. Hence pediatricians should use these tests in their clinic to detect High

Risk New Born and advice detail testing to those who require it.

DETAILS OF TESTS

1. B.S.I.D. :- Useful test for 0-30 months. Indian norms are available made by Dr. Pramila Phatak and training of this tests is available at Human Development Department, Sayajirao University, Baroda. This test requires 40–45 minutes for administration. Interpretation in form of motor and mental D.Q. is done and interventions are advised accordingly.

2. Binet Kamat Test :- Useful test for 3–16 years. This is an Indian version of stand ford Binet Test. This test draws I.Q. and is dependent on schooling of the child. At present this the best test available. This test gives mental age but can not give details of areas of development.

3. Weschler's Test :- The Indian version is available from Dr. Mahendrika Bhatt Ahmadabad. This test is accepted internationally and gives areas of intelligence and helps in therapy. But this test requires 1.5 – 2 hours.

4. I.C.I.T. By Jana Prabodhini :- Useful test to detect and treat learning disorders. This test also requires 2 – 2.5 hours.

TIMING OF TESTS

First detail testing should be at 3 months and then at 6, 9, 12, 18, 24 months of age . After that IQ is done at 3 years and can be repeated yearly. At every visit stimulation program and various therapies should be reviewed and discussed. Regular follow up is very important in such clinic.

Sensory (vision / hearing) test, behavioral audiometry and simple vision test can be administered in 5 – 10 minutes. Investigations required can be Hb, Metabolic screen, U.S.G., E.E.G., C.T. Scan, etc.

The Value of Developmental Assessment :-

1. Every parent wants to know whether his child is developing normally especially if there is past history of handicap. It also gives confidence in upbringing of child and use of potential in case of backward children.
2. It also provides vital information for the neonatologist to face ethical problems regard to resuscitation of very low birth weight (VLBW) babies.
3. Early diagnosis of defect of vision and hearing; subluxation of hip, clumsiness, features of learning disorders. Early diagnosis is important because intervention can be done and stimulation programs are available.
4. To observe the effect of treatment of metabolic disorders, exposure to toxic substances, convulsions, meningitis and many more condition which can cause brain damage.
5. In order to make a decision about suitability for adoption Developmental Assessment is essential and must be done by an expert.
6. Early diagnosis of mental subnormality in High Risk cases.
7. Medicolegal Purpose. Mental subnormality can be confidently diagnosed in first 2 years apart from the obvious forms such as Down's syndrome. For practical purposes this is the most important function of developmental test.
8. It is easy to determine the sequence and rate of growth of average child and to note the frequency with deviations from the usual growth pattern occur as a result of known or unknown factors.

Aims of Early Stimulations :-

1. Stimulating the child through the normal developmental channel.
2. Prevention of developmental delay.
3. Prevention of asymmetries and abnormalities.
4. Detection of transient abnormalities and

minimization of persistent abnormality. Development depends upon the biological inheritance and environmental stimulation or learning. Thus stimulation plays important role in child development. Various easily available age appropriate toys and environment is advised and optimum time for stimulation is when the child is most active and playful.

AVAILABLE INDIAN STIMULATION PROGRAMS

A. C.D.C. Trivendrum 0–1 years - Excellent program which considers mother as therapist and states details of play and therapy from 0–3, 3–6, 6–9, 9–12 months.

This program was published in Indian J of Pediatrics (Nov. - Dec. 1992 page no. 663 – 667). Marathi version is also available.

We can ask parents to tick out what baby is doing and then discuss with the parents about what the baby is expected to do and help them out to get things done. Aim of this program is to make child independent in all areas of development and stimulate the mother to give therapies.

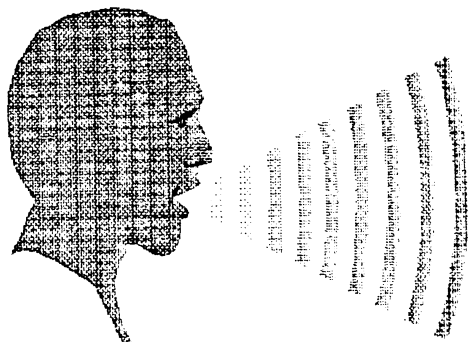
Limitations of this program are :

1. This is available only from 0 – 1 year
2. This does not take in to consideration various areas of development differently like fine motor, gross motor, language etc. but considers all areas under one program.

B. INPA's portage stimulation program available as Sanvahan Pradarshika. This stimulation program is available in Hindi and Punjabi and is a version of portage education package initially made in U.S.A. in 1969. The Indian version has come in Nov. 1994. This program is used in 70 countries all over the world. This program considers stimulation

VOICE COMMUNICATION

Parents should talk by looking into eyes of the child. They should talk slowly, clearly and the pronunciations should be clear so as to read lip and tongue movements.



in 6 areas 1. Shishu Protsahan or Infant Development 2. Samajikaran or Social Development 3. Bhasha vikas or Language Development 4. Swavlamban or Making the child Independent 5. Dnyanatmak Vikas or Intelligence Development. 6. Sanchalan Vikas or Motor Development.

This is an excellent program which considers extensively each and every item in above mention field of development in detail. This programs tells the mother “Aap ne kya karana Hai” or What mother should do about every small item and What toys or environment is essential for the same. It also explains the steps of How to do the target item. The material mentioned in the program is not at all costly and is available in Indian continent and the items are also converted by taking in to consideration our Indian culture. There are total 574 items mention in 6 areas. This program is available from Dr. Mrs. Tehl Kohli, Department of Education Punjab University, Chandigarh. You have to become life member of INPA. These two books of Sanvahan Pradarshika are economic compared to thousands of rupees on non useful medicines.

INPA has started two correspondence certificate courses first time in India

1. On Learning Disorders
2. On Early Intervention

These courses are postal and the person who gets training can administer the program by asking the High Risk babies mother’s to visit the clinic weekly and can give target items for that week.

C. The Upanayan Early Intervention Program

The system comprises of : (1) a development check list of skills for assessment and programming, (ii) a profile to record the observations, (iii) intervention strategies in the form of activities to acquire all the skills in the check list.

The program is designed for the Indian socio-economic conditions and is available in the form of

a printed manual, and also as a computer software The two can be used independently of each other.

The program has been translated into Hindi, Tamil, Malayalam and Marathi.

Limitations of this program

1. The kit weighs 17 kg.
2. Requires 2 week hands-on-training. This training is free of cost available at Madhurayan Center, Chennai. This is also good intervention program.

D. NIMH Towards Independent Series - These are the booklets costing only Rs. 10/- each and they help the child to become independent. They teach how to learn about bathing, wearing cloths, brushing, eating meal etc. They are available at NIMH Secundarabad.

E. Learning Resources center Pune Stimulation Program for 6 -10 years

- This program is useful especially for slow learner (I.Q. 70-90) and learning disorder children. This program consist of interesting play media for learning like searching of princes to learn arithmetic etc. This program is available at no profit basis and costs Rs. 1500/- for 1 - 4 std.

F. Toy’s Stimulation Program 0 - 10 years (Marathi) - All toys suggested are scientifically thought to be useful for that particular age and are cheap and easily available all over India.

G. For 6 - 9 years Program by Dr. Oberoi (Hindi)

H. Other Programs - They are institute based and individualized programs like K.E.M. Pune, P.G.I. Chandigarh, N.I.M.H.A.N.S. Bangalore, etc. There are published but not available freely to common pediatrician.

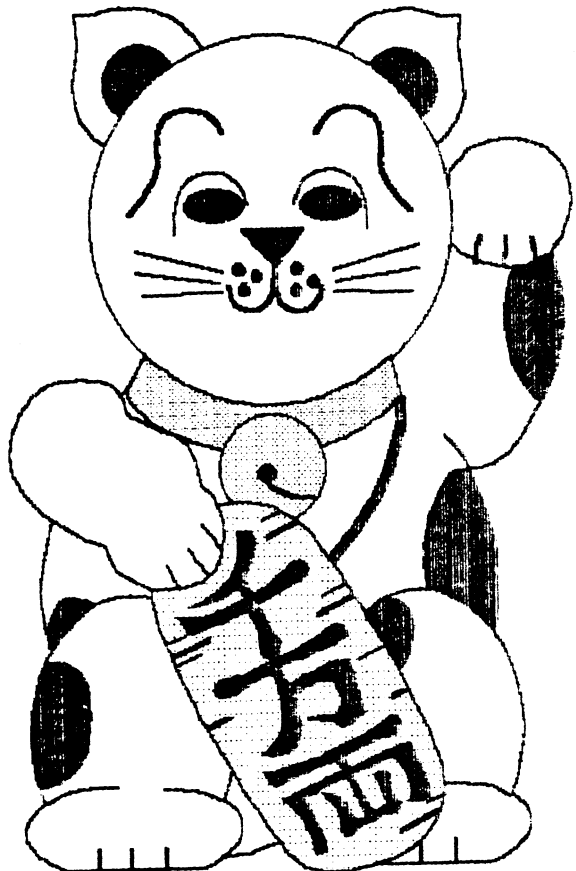
NEED OF FUTURE

There should be well coordinated stimulation programs which are tested in the institutes and these programs should be available in book form and training should be of not more than a week. These programs should consider mother as therapist and they should be available from 0 - 16 years. The scattered programs all over country should be

aggregated and should be readily available. Special needs of certain group like Cerebral Palsy, Down's syndrome, etc should be kept in the mind while administering of the program. Such programs will help to improve the outcome of High Risk New born and will help them to achieve their potential.

TOY'S STIMULATIONS PROGRAM

Toy's included in this program are easily available.



SUMMARY

We have seen that any pediatrician who is interested can run a child development center at primary level where he can detect High Risk babies and screen them with simple screening tests and give them stimulation programs and follow them regularly. If he requires help he can send patients further to a full fledged child development center where staff like Clinical Psychologist, Educational Psychologist, Speech therapist, Occupation therapist and

Physiotherapist are available. He can manage High Risk babies as well as developmental and learning disorders with few day's training and update himself regularly. He can manage common problems like Nocturnal Enuresis, Stuttering, Negativism, Thumb sucking, etc. by intervening early. Team work will give best results but the pediatrician should be a master of the orchestra.

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 - c. Dr. Mahendrika Bhatt, Ahmadabad.
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