Chapter III

MATERIAL AND METHODS
The present study has been carried out over a period of 2 years (1997-1999) on a longitudinal basis with the aim to obtain empirical information about Kashmiri Urban children on growth and development in the first two years of life and compare it with that of other Indian Children. One basic need that was fulfilled by conducting the present study was to obtain much needed developmental norms and patterns of Kashmiri urban children.

Material Used

A sample of urban children born to normal mothers without any evident medical problem likely to interfere with growth or development from Srinagar city was registered and followed for two years. Children with any morbidity (especially of chronic nature) or other factor likely to affect growth and development were not retained in the study.

Sampling

A multistage purposive random sampling technique has been used to select the children. The urban area of Srinagar city was arbitrarily divided in 4 zones (North, South, East and West). From each zones 5 wards were randomly selected and from each ward between 100-150 households were visited to register newborns (up to ten days old). The initial plan was to get around 300-350 newborns cohort as a sample to be observed over a period of two years. However, by this technique only a sample of around 150 newborn was obtained and therefore to maintain a sample of minimum of 300 children, the investigator had to contact the hospital discharging section of two main obstetric hospitals.
of the valley to catch the mother at the time of their discharge having delivered an alive baby. Only such mothers who were hailing from our initial selected group of wards were registered. The whole exercise took 3 months to register the required number of babies.

**Method Used**

- **For Assessment of Growth**
  
  Anthropometric measurements of weight and Crown Heel Length

- **For Assessment of Development**
  
  Assessment of various items of development as described under DDST II’s broad headings of Gross Motor, Fine Motor, language and Socio-personal

  The Denver II contains 125 items but some of these items had to be dropped because it would require keen personal observation. By simply leaving instructions at home to record such items by surrogates (mothers/fathers) would have been biased.

  Under ‘Gross Motor’ following items have been observed tested


  Under ‘Fine Motor’ following items have been observed

Under 'Language' following items were observed

1) Vocalizes (2) Oh, Ah. (3) Laughs (4) Squeals (5) Turns to rattling sound
(6) Turns to Voice (7) Single Syllables (8) Imitate Speech Sounds (9) Dada
Mama- Non Specific (10) Dada Mama Specific (11) Combine Syllables
(12) Jabbers (13) Words (14) Combining Words (15) Naming and pointing
pictures (16) Pointing body parts (17) Knowing 2 actions.

Under 'Socio-Personal' following items were observed recorded

1) Regards face (2) Social smile (3) Regards own hand (4) Works for toy
(5) Feeds self (6) Plays-pat-a-cake (7) Indicate Wants (8) Wave (9) Plays ball
(10) Initiate Activities (11) Drinks from cup (12) Helps in house (13) Use spoon
(14) Feeds Doll (15) Brush Teeth with help (16) Wash hands.

Tools Used (Testing Kit)

• For growth
  Electronic Weighing Machine
  Infantometer (specially designed for the purpose)

• For Development
  Following items have been used for testing purpose:
  Rattle, Yarn, Cubes, Ball,
  Pictures of cat, dog, bird, man and horse,
  Cup, Small bottle, Toy, Spoon, Raisin, Pencil, Copy and Tooth brush.

Standardization

The various tests were discussed in detail before hand and their assessment was
first performed by the investigator with the help of a pediatrician and then applied on
trial basis on some children for few days in presence of an expert (Pediatrician). This
exercise was repeated several times to become familiar with the use of test and passing an item using the test. This also avoided intra-personal variation. Once cleared by the expert (Pediatrician) the test was applied by the investigator on randomly selected 20 children (outside the sample) to check the consistency. The whole exercise was done prior to actual start of testing of the study group. For collection of other information a pre designed, pre tested schedule was used.

Testing Procedures

Growth

Length was measured with the help of an infantometer with the child lying supine. The head touching the headboard, and the knees were held extended. The second board touching the feet (the whole foot and not just the toes). The length was read from the measurements in centimeters marked on the infantometer.

Weight was recorded with the help of an electronic weighing machine. During the first year of life when the child was unable to stand the mother was asked to pick up the child in her lap and then weight of both mother and child was recorded. After that only mother’s weight was recorded and her weight was subtracted from the weight (mother and child) recorded earlier. Thus the child’s weight was obtain. During 2nd year the child was asked to stand on the weighing machine and his weight was recorded.

Development

- For regarding hand, it was made sure that the child stared at hands for several seconds.

- For grasping rattle the child was passed when he grasped the rattle when it was touched to the backs or tips of fingers.
• In case of looking for yarn, the child was considered to have passed the item when he tried to see where the yarn went. Yarn was dropped quickly from sight from tester's hand without arm movement.

• In case of passing cube, if the child transferred cube from hand to hand without help of body, mouth or table, then only he was considered to have passed the test.

• For thumb finger grasp the child was considered to have passed, if he picked up raisin with any part of thumb and finger.

• In case turning to rattling sound, one cube was placed in cup and shaken gently near child's ear, but out of sight. The same thing was repeated for other ear.

• For naming pictures, the investigator pointed towards the picture and asked the child to name it. (No credit was given for sounds only). If the child failed to name at least 4 pictures correctly then the child was made to point to picture as each was named by the investigator.

• For pointing body parts a doll was used. The child was asked to show the eyes, ears, mouth, hands, feet, tummy and hair. If the child was able to point 6 parts he was considered to have passed the test.

• In case of knowing two actions, the pictures cat, horse, bird, dog and man were used. The child was asked to name or point which one flew, mew, talked, barked and galloped. If he was able to pass 2 of 5, he was considered to have passed the item.

• For walking up steps the child was considered to have passed the item when he used wall or railing only, not person.

• For throwing ball over hand, the child was made to throw ball over hand 3 feet top within arm's reach of investigator.

• Some items were passed as reported by their mothers.

• For brushing teeth, the parent was allowed to help guide toothbrush and put tooth paste on brush, care was taken to see that the child was very comfortable and interested in doing the whole task.
Follow Up

Children were registered in such a way that they made one separate cohorts for each month. Each cohort would accordingly get a follow up after a gap of 3 months as per their turn. On an average twenty children were observed every week.

Certain number of children could not be followed either because they had changed their address or were out of station for more than six months. Some children were non cooperative and/or their mothers were reluctant to get their children weighed or observed for developmental test item. Four children died during 2 years period. The final sample left was only 194, who have been regularly followed without much non-compliance.

Analysis

The analysis was divided into two main parts. First part dealing with growth and second part with development.

Part I

- Simple frequency analysis was done to group children within various weights and Crown Heal Length ranges and to determine average with standard deviation for weight and Crown Heal Length at specific months during 2 year period.

- Percentile of weights and Crown Heal lengths at specific months were determined and then compared to NCHS and ICMR standards.

- Impact of various socio-medical factors like weaning, feeding pattern, mother’s literacy and working status, income, birth order and birth spacing on growth pattern was determined and differences if any tested by applying test of significance (t-test).
Part II

- Simple frequency analysis was done to group children into various months in which they acquire various developmental milestones. The average ages with standard deviation for attaining milestones was also determined amongst children under study.

- The analysis was further carried out to determine ages at which 25%, 50%, 75% and 90% of children would pass a particular milestone in our sample.

- Impact of various socio-medical factors on the mean age of attaining a particular milestone was determined by applying test of significance (t-test). For this purpose randomly chosen items from 4 major categories were selected.

Limitations

The researcher had to face a number of difficulties while collecting data. Prevailing conditions in the valley proved to be at times a hindrance in collecting data. Mothers of children especially illiterate were not very co-operative and were occasionally reluctant to allow the investigator to take anthropometric measurement especially the weight of child and also testing of an item under a particular category of milestone. It needed lots of persuasion and motivation on the part of the investigator to overcome the wrong beliefs and taboos attached with weighing or testing of milestone in a child. The reason for drop out was attributed to this fact.

A monthly visit and data collection would have been ideal but it was not operationally feasible for the investigator to cover 300 children every month and repeat the exercise monthly. Therefore a gap of 3 months was decided and the researcher had to relay at times upon the mother’s observation for occasional responses. The variation if any
could be attributed to the fact that mothers might not have given the exact age of attainment of various milestones.

Time proved to be another constraint for data collection. Sometimes the investigator had to wait for hours to observe the child once the child was non-cooperative, sleeping or out for some time and the target of completion of requisite number of children would not be fulfilled.