

# INVESTIGATION OF THE PROBABLE CAUSES OF SPECIFIC CHILDHOOD DISABILITIES IN EASTERN AFGHANISTAN (PRELIMINARY REPORT)

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## SUMMARY

*To identify risk factors likely to cause developmental disabilities and to generate hypotheses for a further study of risk factors predisposing to disability and slow mental and physical development. Mothers and children attending/visiting the Sandy Gall's Afghanistan Appeal (SGAA) clinics in the East Zone of Afghanistan. The main outcome measures, developmental disabilities, cerebral palsy (CP), club foot, CDH and polio. Results, 37.5% of the disabilities were present at birth, 46% of the disabled children were born from parents who are 1<sup>st</sup> cousin which was confirmed by computing  $\chi^2$  value, which is 10.87 with one degree of freedom. 58.3% of the disabled children were born from parents who lack antenatal care. 22.4% of the pregnant women in the defined population had antenatal checkups, and 97% of the mothers in the defined population are illiterate, 52% of the children found with CP specific and mental retardation. 25% were with delayed physical and mental development. 13% were with CP specific and 10 % were club foot. 2% of the children were visually handicapped, 9% with hearing impairment. 61% of children were from Nangarhar, 25% from Laghman and 14% from Kunar.*

**Key words:** developmental disabilities, children, Afghanistan

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## INTRODUCTION

From May 2000 to March 2001 Sandy Gall's Afghanistan Appeal (SGAA) conducted a survey with a result of increasing numbers of patients with cerebral palsy (CP), clubfoot and other developmental disabilities seen at its physiotherapy clinics in Eastern Afghanistan. SGAA wanted to identify the possible causes of these developmental disabilities in order to plan preventive measures. The study investigated the relation between maternal health factors, socio-economic and environmental variables and the occurrence of cerebral palsy and developmental disabilities.

Afghanistan has meager resources and inadequate services for the early detection and rehabilitation of children with disabilities. Twenty years of conflict and the continuing displacement of the population as refugees has increased the problem of planning and provision of services for the disabled.

An extensive literature search for this survey showed that even in developed countries like USA, Australia and the UK that provide good ante-natal care, there is a growing incidence of CP. Very low birth weight infants constitute more than one-quarter of all new cases of CP, and for this planter reflex profile and perinatal risk factors have been evaluated (1-4). These children are generally from poor ethnic communities, the Caribbean population in Atlanta, USA or the Asian population in Bradford, UK.

In the prevalence rate of developmental disabilities (DD) among children aged 3-10 years, in Atlanta, Georgia, surveillance program, 1991, it was revealed that with regards to cerebral palsy,

mental retardation, hearing and visual impairment, the rate was (599) 2.4%, (2,193) 8.7%, and (283) 1.1% respectively.

But in North Iraq 2,062 children seen over 30 months at rehabilitation center were included in the survey. 44% of the parents in this study were related while in communities in most of the USA and Europe the rate of consanguinity among parents was 0.2–0.4%. Consanguinity in Sulaimaniya is 80–100 times higher than in communities of Europe. The CP ratio was 30% spastic, 30% mixed, 20% choreo athetoid, 10% ataxic and 10% hemiplegic. An initial 10-year (1985–1995) literature search on causes of CP and DD only produced three or four studies done in developing countries. The other studies had all taken place in developed countries.

In order to plan primary preventative health care in Afghanistan continued research has to be done on the needs and wants of the population based on aetiological factors. This study could serve at least for some as a stepping-stone to more advanced epidemiological studies about the disabled population groups in Afghanistan.

## MATERIAL AND METHODS

### Participants

We selected 633 children registered and treated at SGAA's clinics in the eastern region of Afghanistan between 1993 and 2001. All cases were aged 0-15 years and diagnosed as either cerebral palsy,

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specific, delayed physical and mental development, club foot or congenital dislocation of the hip. Controls were represented by Afghani children, randomly selected by the register from the same resident area and were matched to cases for age and sex, and who were alive at the time the case subject's some disorder was diagnosed. The register has been compiled to monitor the incidence of these disabilities and to provide information for further research.

### Research Methodology

A research paper of Columbia University New York provided information on methodology for identifying disabled persons for motor, cognitive (vision, hearing and speech) disabilities from a comparative survey in Pakistan, Bangladesh, and Jamaica. This provided the ten-question questionnaire that was used as a guideline for the child questionnaire. A second literature search from 1995 – 2000 produced the gross motor function test which is currently the most valid test for assessing delayed development for physiotherapists.

### Implementation of the Survey

The survey was originally designed to take six months, but restrictions were imposed by the authorities in Jalalabad and then the survey was extended to nine months to collect more data with a monthly target of 80 – 100 participants; that amounted to a total of 741 cases.

### Survey Timetable

The survey was carried out from May 2000 – February 2001. In March 2001 data input and statistic analysis and in April 2001 the final report were performed.

## METHODS USED TO ELICIT ANSWERS TO THE QUESTIONNAIRES

### 1. Risk factors

The effects of the following potential risk factors were studied.

#### *Prenatal risk factors*

*Diseases.* For all diseases we explained the clinical feature of each disease separately and then asked the mother if she had had any of the explained diseases during the pregnancy or not? For example, we explained clinical feature of toxoplasmosis with very detailed explanations particularly for those who had had more than two cases of abortion. Because of the expense, we were able to test only two mothers who said yes ("I had this problem and still I have the same problem"). The results for toxoplasmosis were positive.

#### *Postnatal risk factors*

*Bacterial meningitis.* We saw 4 patients that had bacterial meningitis and encephalitis and had kept their result cards with them. During our survey we did not find sickle cell anemia.

#### *Perinatal risk factors*

##### *a) Prolonged labour, birth asphyxia*

Information about slow delivery (prolonged labour) provided answers for two other questions regarding anoxia and a low APGAR

score from the patient's explanation. The mothers explained about the duration of delivery for the disabled child and if she had any problem with the delivery of their disabled child.

##### *b) Low birth weight*

We asked the mother to tell us about the weight of her child at birth. Some of the mothers said "to tell you the truth in comparison to my other children this child was lighter than the others". Some of the mothers said it was just like a worm (chingia). But those who had the delivery in hospital, said the doctor asked them why their child is lower in weight than normal: "did you take any kind of medicine or had any serious disease during pregnancy?"

##### *c) Premature labour*

We asked the mother to tell us about the duration of pregnancy; did it last nine months. They gave us the time of duration of pregnancy in relation to the months of their crops. They said that during the sowing of opium or wheat was the last time we had our menses and the same for estimating the length of the pregnancy.

##### *d) CP at birth*

To know if the child was CP from birth we asked the mother when she had noticed that her child had a problem. Some of mothers told us from birth, others said after six months and others said after one year. For those who said after birth we asked them how they knew. The mothers answered that from the birth of the child till three or four months there were no special improvement of the child as compared to other children. Others said that they waited until one year for the child to be able to sit but it could not. Until then there had been no serious problems but when they tried to make him/her sit or stand, it was a different kind of reaction in comparison to the other children.

##### *e) Low APGAR score*

The respiration rate and other signs like pulse rate activity were not easy to obtain from the mothers. APGAR score was considered low when the mother explained that the child did not cry, or if the skin colour was blue (they used the word "tak shen"). If the first reflex of the neonate to the external environment, crying, was lower than normal, we put them under low APGAR score, this itself gave us clue about hypoxia.

### 2. Statistical analysis

We performed tests for disability between cases and controls for all categorized variables, assuming a  $\chi^2$  distribution. We calculated odds ratio and 95% confidence interval (not presented) as a measure of relative risk using the SPSS statistical package, using the tests of linear association as well as independence for contingency tables. We also derived tests for trend for categorical variables with more than two categories. We entered ponderal index and birth weight for gestational age in separate models.

## RESULTS

The study population comprised male and female children of all categories in the age group of 0-15 years. The sample consisted of 633 parents of disabled children residing in three provinces. The weight and height of the children were below average as

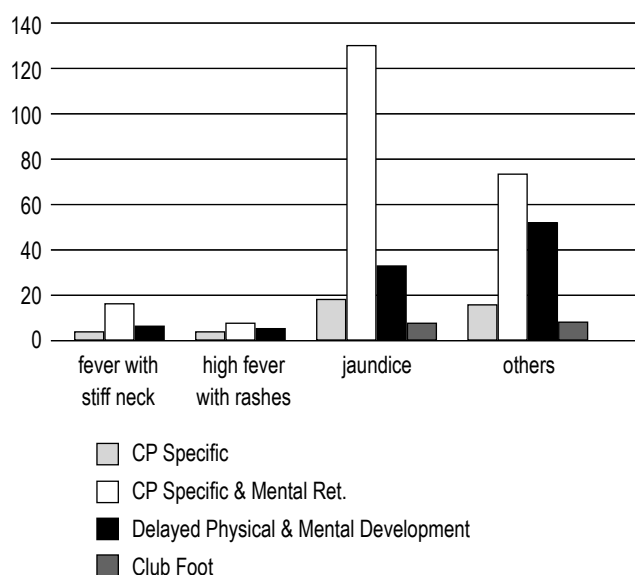


Fig. 1. The ratio of developmental disabilities in the East zone of Afghanistan.

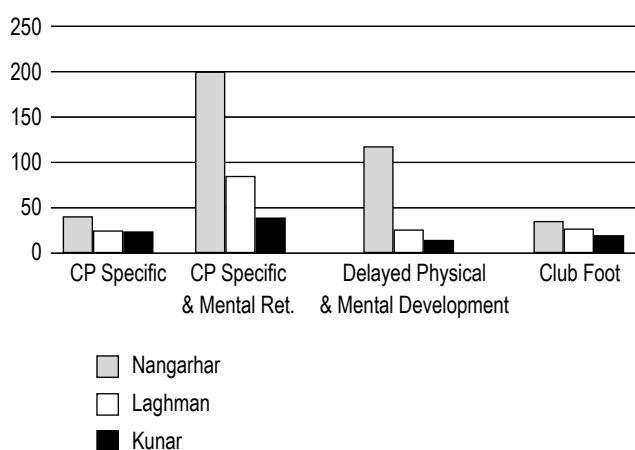


Fig. 2. The ratio of developmental disabilities in three provinces of Afghanistan.

compared to controls. The median weight of 0 - 6 years was 8.6 kg and height was 110 cm.

- 88% of the mothers interviewed had delivered at home, only 7% in hospital and 5% at private clinics.

- 73% of the children were delivered by relatives, 9% were delivered by doctors, 8% were delivered by nurses, 8% by dais (informally trained birth attendants) and 2% by midwives (formally trained birth attendants).

- 37.5% of the disabilities were identified at birth. Disabilities of congenital origin are more significant.

- 46% of the children were born of parents, who were first cousins, which is confirmed by computing  $\chi^2$ , which is 10.87 with 1 degree of freedom.

- 52% of the children had cerebral palsy specific and mental retardation, 25% had delayed physical and mental development, 13% had CP specific and 10% had club foot.

- 80% of the children in the defined population had speech problems, 9% had hearing impairments and 2% of the children were visually handicapped.

- 6% of the children were born of mothers suffering from anaemia, which is confirmed by computing  $\chi^2$  value. That is 17.3 with 1 degree of freedom.

- 51.3% of the disabled children had one parent who suffered from malaria (or high fever)

- 58.3% of the disabled children were born from mothers who had received no pre-natal care.

- 32% of the children were born of parents suffering psychological stress, which is confirmed by computing  $\chi^2$  value. That is 6.94 with 1 degree of freedom.

- Most families in low-income groups have disabled children. The impact of low-income has a positive association with all type of disabilities.

- The average age of the children was 5 years. 56% of the children were less than 5, 36% were between 5-10, and 8% above 10.

- The average age of the mother was 35, and the average age of the father 42.

- 97% of the mothers in the defined population were illiterate, 2% had primary education and 1% were graduates.

### Analysis of Findings Factors

The statistically significant factors in cerebral palsy (Table 1) were:

- Family history of disability
- Congenital factor (disability at birth)
- Anaemia
- Hyperemesis gravidarum
- Trauma
- Consanguinity and too slow delivery
- Psychological stress

The statistically significant factors in delayed physical and mental development (Table 2) were:

- Absence of prenatal care
- Urinary tract infection (UTI)
- Malnutrition and low birth weight
- High fever (12% possibly due to malaria or infection. Patients did not take drugs regularly and had repeated attacks of malaria)

### DISCUSSION

From international research 15 risk factors likely to cause developmental disabilities were identified. Eight of these were found as significant in this study. Several studies have been carried out at different stages of gestation for identifying association with CP (5-12).

- Low birth weight was found in delayed development but no cases of premature delivery were found. This was possibly due to the inability of the survey team to get correct information from the mothers. Register in Mehtarlam hospital shows that low birth weight and premature births are important factors among cerebral palsy children.

- 6% of cases took antibiotics during pregnancy, which is low by international standards.

**Table 1.** Association between CP and statistically significant factors ( $n = 411$ ,  $df = 1$ )

	CP specific (CP)				CP specific and mental retardation (CP&MR)				Higher in	Pearson $\chi^2$		Continuity correction		Likelihood ratio		Linear-by-linear association		Fisher's exact test	
	Y	N	T		Y	N	T			V	A	V	A	V	A	V	A	2-sided	1-sided
Family history of disability	12	73	85		16	310	326	CP		9.008	0.003	7.615	0.006	7.620	0.006	8.986	0.003	0.006	0.005
Congenital factor	44	41	85		108	218	326	CP		10.047	0.002	9.263	0.002	9.781	0.002	10.023	0.002	0.002	0.001
Anaemia	54	31	85		153	173	326	CP		7.429	0.006	6.780	0.009	7.508	0.006	7.411	0.006	0.007	0.004
Hyperemesis gravidum	12	73	85		77	249	326	CP&MR		3.588	0.058	3.050	0.081	3.870	0.049	3.579	0.059	0.075	0.037
Trauma	3	82	85		29	97	326	CP&MR		2.704	0.100	2.008	0.156	3.190	0.074	2.698	0.100	0.115	0.071
Consanguinity and too slow delivery	12	73	85		26	300	326	CP		3.031	0.082	2.344	0.126	2.757	0.097	3.024	0.082	0.093	0.067
Psychological stress	35	50	85		107	219	326	CP		2.081	0.149	1.728	0.189	2.042	0.153	2.076	0.150	0.160	0.095

Legend: n = total valid cases, df= degrees of freedom, Y = yes, N = no, T = total, df = degrees of freedom, V = value, A = asymp. sig (2-sided)

**Table 2.** Contingency table of delayed physical and mental development ( $n = 156$ ,  $df = 1$ )

	Male				Female				Higher in	Pearson $\chi^2$		Continuity correction		Likelihood ratio		Linear-by-linear association		Fisher's exact test	
	Y	N	T		Y	N	T			V	A	V	A	V	A	V	A	2-sided	1-sided
Absence of prenatal care	40	45	85		50	21	71	females		8.652	0.003	7.721	0.005	8.786	0.003	8.596	0.003	0.004	0.003
Urinary tract infection	4	81	85		14	57	71	females		8.542	0.003	7.134	0.008	8.821	0.003	8.487	0.004	0.005	0.003
Malnutrition and low birth weight	7	78	85		13	58	71	females		3.513	0.061	2.670	0.102	3.522	0.061	3.491	0.062	0.091	0.051
High fever	14	71	85		5	66	71	males		3.215	0.073	2.394	0.122	3.363	0.067	3.195	0.074	0.088	0.059

Legend: n = total valid cases, df= degrees of freedom, Y = yes, N = no, T = total, df = degrees of freedom, V = value, A = asymp. sig (2-sided)

• There were only 5 cases of forceps delivery registered because the vast majority of women deliver at home with family members assisting.

• 6% of cases had birth asphyxia which is low by international standards.

• Malaria was not significant (in mothers).

• Malnutrition of mother was found to be a factor in delayed development (75% of mothers had insufficient breast milk).

• Urinary tract infections were a factor in delayed development, not in cerebral palsy.

• Consanguinity and family history of disability was a risk factor for cerebral palsy.

• Prolonged labour (too slow delivery) was a risk factor for cerebral palsy.

• High fever could be due to malaria or infection. Patients did not take anti-malaria drugs regularly and had repeated attacks of malaria. This was found significant in delayed development.

• Anemia was only discovered when antenatal clinics sent the patient for a haemoglobin count and then prescribed iron tablets.

The results of the survey provide important guidance for the Safe Motherhood Initiative being carried out in Afghanistan to improve prenatal, perinatal and postnatal care.

## CONCLUSION

The statistically significant factors in CP and delayed development are anaemia, psychological stress, trauma, consanguinity, congenital factor and family history of disability, malnutrition, absence of prenatal care, UTI and low birth weight. 6% of the cases were given antibiotics during pregnancy, 6% of cases had birth asphyxia and only 5 cases of forceps delivery in the study is low compared to other countries. Malnutrition and urinary tract infections were seen in delayed development cases. Prolonged labour is synonymous with too slow delivery seen in CP.

It is strongly recommended:

• a randomized representative study to carry out in selected provinces of Afghanistan.

• Ideal standards of antenatal care / promotion of antenatal care should be implemented, like diet during pregnancy, general advice about diseases, health care provided to pregnant women, preparation for breast feeding, monitoring of growth of fetus during pregnancy, antenatal screening, training of the TBAs etc.

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