

# Neurodevelopmental Outcome at 6 Months Following Basic Neonatal Resuscitation in Rural Tanzania

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# Neurodevelopmental Outcome at 6 Months Following Basic Neonatal Resuscitation in Rural Tanzania

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## Background:

Basic neonatal resuscitation using bag-mask ventilation has decreased neonatal mortality. Birth asphyxia increases the risk of neurodevelopmental impairment. Few studies have investigated neurodevelopmental outcome in resuscitated children in low-resource settings.

## Objective:

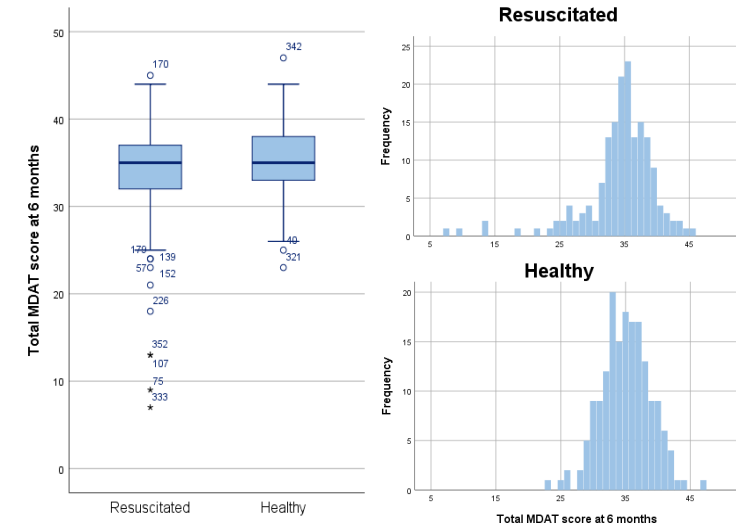
To describe the neurodevelopmental outcome at 6 months in children who received neonatal resuscitation.

## Method:

Children who received bag-mask ventilation at Haydom Hospital in rural Tanzania were examined at 6 months using Malawi developmental assessment tool (MDAT). MDAT possesses four domains; fine motor, gross motor, language, and social skills, with 36-42 items in each domain. Each item passed gives 1 point, providing a total score for each domain and a total MDAT score. Random healthy controls from the same geographic region and socioeconomic status were recruited and assessed with the same tool. Children with gestational age  $\leq 35$  wks were excluded. Neurodevelopmental disability was defined as failing 2 or more items in one domain within the 90 percentile of the normal reference value.

## Results:

- 168 resuscitated and 172 healthy controls were included.
- Median scores of gross motor, fine motor, language, social skills, and total MDAT were equal in the resuscitated and the healthy cohort, but had a skewed distribution in the resuscitated cohort.
- There was a significant difference in distribution of gross motor scores in resuscitated compared to the healthy group. Fine motor, language, social skills, and total MDAT distributions were not significantly different.
- 14,9 % of resuscitated and 5,2% of healthy children were defined as having any neuro disability.
- Preliminary analysis indicates an association between any disability and low weight, height, head circumference, and reporting seizures at 6 months of age, and staying at the neonatal unit 24 hours after birth.



|                | Resuscitated<br>N=168 |            | Healthy control<br>N=172 |          | p-value            |
|----------------|-----------------------|------------|--------------------------|----------|--------------------|
|                | MDAT score (range)    |            | MDAT score (range)       |          | Mann<br>Whitney-U  |
| Gross motor    | 9 (0-14)              |            | 9(6-14)                  |          | <b>0,018</b>       |
| Fine motor     | 10 (0-13)             |            | 10(4-14)                 |          | 0,080              |
| Language       | 6 (1-9)               |            | 6(4-10)                  |          | 0,434              |
| Social         | 9 (4-13)              |            | 9(5-13)                  |          | 0,152              |
| Total MDAT     | 35 (7-45)             |            | 35(23-47)                |          | 0,163              |
|                | Passed                | Failed     | Passed                   | Failed   | Pearson Chi-Square |
| Gross motor    | 148 (88,1%)           | 20 (11,9%) | 165 (95,9%)              | 7 (4,1%) | <b>0,008</b>       |
| Fine motor     | 155 (92,3%)           | 13 (7,7%)  | 168 (97,7%)              | 4 (2,3%) | <b>0,022</b>       |
| Language       | 166 (98,8%)           | 2 (1,2%)   | 172 (100%)               | 0        | 0,151              |
| Social         | 166 (98,8%)           | 2 (1,2%)   | 172 (100%)               | 0        | 0,151              |
| Any disability | 143 (85,1%)           | 25 (14,9%) | 163 (94,8%)              | 9 (5,2%) | <b>0,003</b>       |
| Seizures       | 1                     | 5          | 1                        | 0        |                    |

## Conclusion:

- Children who received resuscitation at birth have an increased risk of a detectable disability in gross motor and fine motor function at 6 months compared to healthy controls.
- 85,1% of children who received resuscitation will have a normal development at this age.
- There was no detectable difference in the language and social domain.
- A poor outcome seems to be associated with seizures, low weight, and admittance to neonatal unit.



# Background:

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- Birth asphyxia increases the risk of neurodevelopmental impairment.
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# Objective:

To describe the neurodevelopmental outcome at 6 months in children who received bag-mask ventilation at birth compared to healthy controls

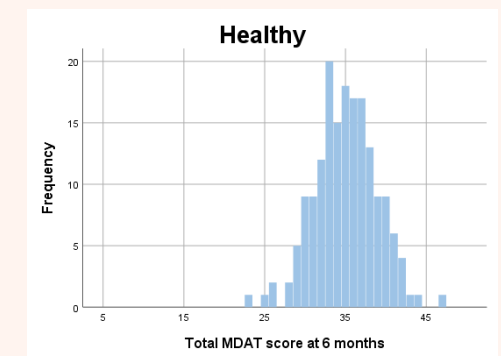
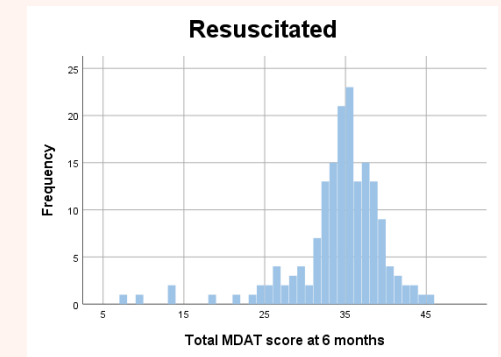
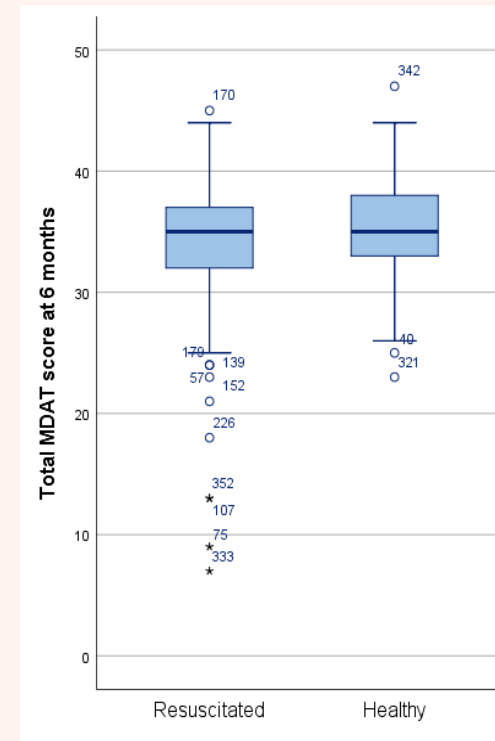
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- MDAT possesses four domains; fine motor, gross motor, language, and social skills with 36-42 items in each domain.
- Random healthy controls from the same geographic region and socioeconomic status were recruited and assessed with the same tool.
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# Results:

- 168 resuscitated and 172 healthy controls were included.
- There was a significant difference in the distribution of gross motor scores in resuscitated compared to the healthy group. Fine motor, language, social skills and total MDAT distributions were not significantly different.

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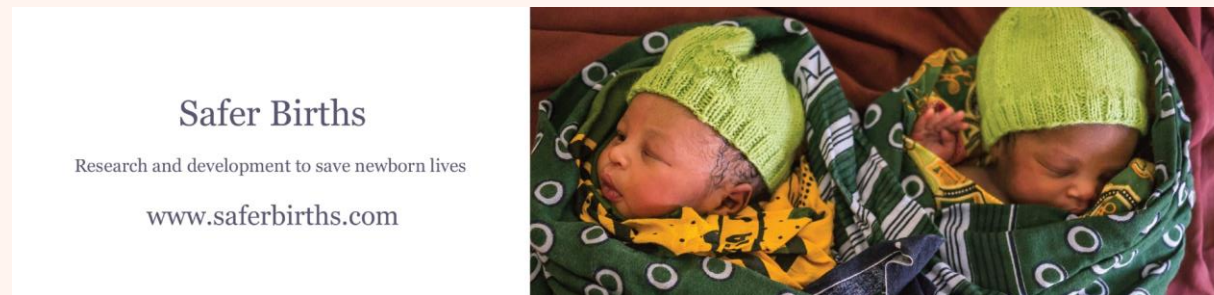
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| Any disability | 143 (85,1%)           | 25 (14,9%) | 163 (94,8%)              | 9 (5,2%) | <b>0,003</b>       |
| Seizures       | 1 (0,6%)              | 5 (3,0%)   | 1 (0,6%)                 | 0        |                    |

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- Preliminary analysis indicates an association between any disability and low weight, height, head circumference and reporting seizures at 6 months of age, and staying at the neonatal unit 24 hours after birth.

# Conclusion:

- Children who received basic resuscitation at birth have an increased risk of a detectable disability in gross motor and fine motor function at 6 months compared to healthy controls.
- 85,1% of children who received basic resuscitation will have a normal development at this age.
- There was no detectable difference in the language and social domain.



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