



Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

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Corresponding Author:

Dr. Jalal-Eddeen A Saleh,
Immunization/Disease Control, World Health Organization, Nigeria, Bauchi Zonal Office, 740001 - Nigeria

Submitting Author:

Dr. Jalal-Eddeen A Saleh,
Immunization/Disease Control, World Health Organization, Nigeria - Nigeria

Other Authors:

Dr. John Nemecek,
Co-Author, Center for Disease Control and Prevention, Disease Control,, Atlanta, GA - United States of America
Dr. Chester Jones,
Co-Author, University Of Arkansas, Department Of Health Promotion - United States of America

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Author(s): Saleh JA, Nemecek J, Jones C

Abstract

Background: Neonatal tetanus (NNT) remains among the leading causes of deaths among neonates in the developing countries with a recorded 130,000 neonatal deaths in 2004. In addition to immunizing pregnant women with 3 doses of tetanus toxoid vaccine, hygienic delivery of the newborn and caring of the umbilical cord are key prerequisite towards meeting with the NNT elimination deadline. The hygienic caring of the umbilical cord aims to ensure that infection by especially tetanus bacteria and irritation of any sort are avoided.

Study Design: Retrospective study

Methods: The study is quantitative and cross-sectional involving mothers who gave birth to NNT babies within their first 28 days of life. The study used secondary dataset from the northeastern Nigeria stored in the NNT database of the Nigeria National Primary Healthcare Development Agency and the World Health Organization Nigeria. The data was collected by trained disease surveillance and notification officers in the region from January 2008 to December 2013.

Results: The results shows that in the six provinces, mothers who did not treat the umbilical cord of their newborn babies in a hygienic way are 68% (147/216) ($n = 147$) and those that did treat the umbilical cord of their newborn in a hygienic way are 32% (69/216) ($n = 69$). Overall, there was significant variation between the proportions receiving hygienic cord care depending upon province (range 17% - 58%).

Conclusion: To achieve NNT elimination, it is paramount for government of countries that still have high prevalence of NNT to ensure that expectant mothers and TBAs are educated on how to hygienically care for the umbilical cords of newborn children. This is in addition to giving 3 doses of tetanus toxoid vaccine to all women of childbearing age especially those living in high-risk areas, hygienic delivery of the newborn, and improved NNT surveillance.

Introduction

In this 21st century, there is no doubt that the global community has shown increase commitment more that ever before towards improving the lives of children across the globe. Although there are some appreciable results in that direction in the developing countries, arguably the positive impact is much in the developed economies. The developing countries are still having enormous challenges with high infant and neonatal death rates. It has been shown that two-third of the neonatal deaths, which often are preventable, occur as a result of vaccine preventable diseases, pre-maturity and birth asphyxia. Thus statistics has shown that 99% of these deaths occur in the low and mid-income countries of the world^{1,2,3}.

Studies has shown that an estimated out of the 10 million children under the age of five years that die annually across the globe, four million of these deaths occur within the neonatal life of these children. Neonatal tetanus (NNT), considered as one of the most underreported deadly vaccine preventable diseases commonly seen in the developing countries, is considered as the main cause of death in the newborn within the first 28 days of life. In spite the increased commitment from governments of countries that have NNT, it is estimated that only 5% of cases reports to the heath services especially within the under-developed countries^{1,2,3,4,5}.

It is as a result of this that in 1989 at the World Health Assembly and also the world summit for children in 1990, that WHO, UNICEF and other partner agencies agreed on a strategic framework for the elimination of NNT in 1995⁴. The NNT elimination framework aims at less than 1 case of NNT per 1,000 live births per annum in every district of every country across the globe. The framework requires the strengthening of routine immunization of all pregnant women with the tetanus toxoid (TT), immunization of women with 3 doses of tetanus toxoid vaccine during their childbearing age especially those living in high-risk areas, hygienic delivery of the newborn, and improved NNT surveillance^{4,5}.

The NNT case definition, used in this study, is any newborn who in the first 2-3 days of life was able to breastfeed, and then suddenly became irritable, could not breastfeed and die within the first 28 days of life¹⁹.

Also considered, as NNT is any death of a newborn child within the first 28 days of life for unexplained reasons¹⁹.

The umbilical cord transports nutrients from the mother to baby in-utero. The umbilical cord ceases to function after birth thus leaving the stump, which usually dries up and falls off within 1-2 weeks after the newborn is born¹⁸. Hygienic caring of the umbilical cord aims to ensure that infection by especially the tetanus bacteria or irritation of any sort is avoided. Hygienic caring of the umbilical cord could be done by keeping the cord clean by adhering to either or all of the following: rubbing the base of the cord with a methylated spirit, or using Goldenseal root and Echinacea; keeping the area dry through adequate ventilation; using sponge bath until after the cord falls off, and allowing the cord to heal naturally¹⁸. The practice of caring of the umbilical cord in the developing countries is often not in accord with the standard norms thus resulting in high prevalence of NNT¹⁰⁻¹⁷.

The strategic plan put in place by has yielded remarkable improvement in NNT globally as evidenced by a 93% reduction in NNT cases. Nonetheless, the fight is far from over as statistics shows that there are still 25 countries as at December 2013 that have not reached the MNT elimination status. Sadly, Nigeria, with all its vast human and capital resources is among the 25 remaining countries with unacceptably high prevalence of NNT⁴. Because of failure of countries such as Nigeria in meeting with the deadline, the target date was revised to 2015^{4,5}.

The 2008 Nigeria Demographic and Health Survey⁶, as shown in Table 1, indicates that the northeastern region has an interesting health statistics: total fertility rate of 7.2 (national 5.7), women age 15-19 who are mothers 39% (national 23%), women who gave birth in the last 5 years and received antenatal care from a skilled provider 43% (national 58%), Births assisted by a skilled provider 16% (national 39%), Births delivered in a health facility 13% (national 35%), Children 12–23 months fully immunized 8% (national 23%), Children 12–23 months with no immunizations 33 (national 29%), Literate women age 15–49/men age 15–49, stands at 23/54 (national 54/77%), and those with no education women age 15–49/men age 15–49, stands at 68/45 (national 36/19%).

Methods

The research is a retrospective cross-sectional quantitative study using NNT dataset collected from

2008 – 2013 involving 312 participants who are mothers of NNT babies. The study used secondary dataset from the northeastern Nigeria. The data was collected by trained disease surveillance and notification officers in the six provinces. The NNT data was archived in the NNT database of the Nigeria National Primary Healthcare Development Agency and the World Health Organization Nigeria. The selection criterion for the participants is that all mothers who gave birth to newborn babies within the first 28 days of life and fit in to the standard NNT case definition. The authors arrived as to whether hygienic care of the umbilical cord was practiced and the type of care given using the outlined questions on the standard NNT case investigation tool.

The northeast region comprises of six provinces namely Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe. The two dominant religions in the region are Islam and Christianity, and the region is less densely populated as compared with the southern region of the country. The rural dwellers are predominantly farmers and often with large-scale production of crops and livestock. The northeastern region, in comparison with other regions in Nigeria, has poorer economic indices and worse health outcomes^{6,7}.

For the purpose of this research work, ethical approval for the use of the NNT dataset was obtained from the zonal office of the NPHCDA. The NNT data was collected from eligible participants in the northeast region using a standard tool.

Informed consent of the participants was obtained from the local authorities and the husbands of these women prior administering the questionnaire. The participants were well informed in the local language that they understood on the purpose of administering the questionnaire. The information obtained was securely kept in the official database, and restricting data access except to authorize persons.

The instrument used for collecting data from the respondents has on its various columns the following: the first column for capturing demographic information of the NNT child, as well as that of the parents. Other columns are tailored to obtain information on the mother's vaccination history, birth of an infant, initial clinical history, cord treatment, action taken in the form of response, and final classification of the case. To ensure that the outcome is valid and generalizable, quality of the items was sought with content validity. The content of the instrument clearly measures what it was expected to measure; thus validity and reliability of the measurement instrument was well tested^{8,9}.

Results

The scores of this study were coded and tabulated using Statistical Package for the Social Sciences (SPSS) version 22. The summary of values, where applicable, includes the mean, central tendency, variance, and standard deviation. Both inferential and descriptive statistics were used to draw conclusions from the sample.

The data were screened for missing data. Missing data were investigated using frequency counts, and several cases were found within the distributions. Specifically, 96 of the participants did not state whether they had their umbilical cord treated ($n_{\text{missing}} = 96$). Thus out of the responses from 312 data participants, 216 evaluated by the chi-squared model ($n = 216$). Displayed in Table 2 is a cross tabulation of the frequencies of mothers that had the umbilical cord of the new born treated across the six provinces in the region.

In this study, mothers who gave birth to NNT babies reported significantly fewer incidences of proper umbilical cord treatments. The figure shown below is a graphical display of the differences between mothers that reported hygienic treatment of the umbilical cord compared to mothers that did not.

Exploratory Analysis

Using SPSS 22, an exploratory analysis for the differences in frequency between cord treatment and province was conducted. The chi-square test of independence conducted for this was to determine if significant differences in frequency of umbilical cord treatments existed between births within the six provinces in the region. The result indicated that there was a significant difference in the frequencies of mothers that had their umbilical cord treated ($p = .005$) — see Table 3 for summary details of the chi-squared tests of independence for the Hypothesis.

Furthermore, there were twice as many births in Nigeria where the umbilical cord was not treated in a hygienic way ($n = 147$) as compared to births in which the umbilical cord was treated in a hygienic way ($n = 69$). Looking at each of the six provinces, Borno province had the highest 83% (49/59) of those mothers who did not treat the umbilical cord of their newborns in a hygienic way while Adamawa province had the lowest 42% (8/19). The proportion in the other provinces is that Bauchi province had 73% (36/49) who did not observe hygienic treatment of the cord of their newborn babies ($n = 36$); Gombe province had 68% (28/41) ($n = 28$); Taraba province had 54%

(23/42) ($n = 23$); and Yobe province had 50% (3/6). Thus, the results shows that in the six provinces, mothers who did not treat the umbilical cord of their newborn babies in a hygienic way are 68% (147/216) ($n = 147$) while those that treated the umbilical cord of their newborn in a hygienic way are 32% (69/216) ($n = 69$).

Using frequency statistics and chi-squared tests, the study is able to determine if there exist significant differences in the frequency of umbilical cord treatments between births within six Nigerian provinces.

Discussion

The results from the single sample proportions and chi square tests of independence all shows that significant differences existed between mothers that indicated receiving treatment and those that did not and that there were twice as many births in Nigeria where the umbilical cord was not treated ($n = 147$) as compared to births with cord treatment ($n = 69$). The findings from this research is supported various studies on NNT. It is interesting to mention that the typical local cord practices in the northeastern part of Nigeria include the use of charcoal or cow dung to dress the umbilical cord of newborn babies¹⁰⁻¹³. Various literature shows that unhygienic birth practices is common in the developing countries of especially West Africa notable among them is Nigeria. The common practice in the African continent of especially the western region is cutting of the umbilical cord with unsterilized or contaminated sharp objects and application of charcoal or cow dung to the umbilical cord of the newborn¹⁰⁻¹³. In comparison to other developing countries of the Asian continent, treatment of the umbilical cord is either with ghee/surma or charcoal as the case may be¹⁰⁻¹⁴. Additionally, similar studies show that other harmful cultural practices that often practiced throughout the developing countries that results in the high prevalence of NNT include the use of hot fomentation, application of charcoal as a means of caring for the umbilical cord^{15,16,17}.

The findings from this research is supported various studies on NNT in various developing countries, which showed that the unhygienic birth practices, cutting of the umbilical cord with unsterilized or contaminated sharp instruments, and treatment of the cord with a cow dung, ghee/surma or charcoal are contributing factors to neonates developing NNT¹⁰⁻¹⁴.

In a study conducted in rural areas of northern Ghana, it was observed that most mother of newborn children

lack adequate knowledge on the practice of safe cord care. The study noted that out of the 404 newborns, only 1 (0.2%) had safe cord care²⁰. Additionally, in a similar study in Sylhet District of Bangladesh, the authors observe high prevalence of unhygienic cord care practices among care givers in the area²¹. These studies and other similar studies show that lack of knowledge on unhygienic caring of the umbilical cord among caregivers is an important factor that predisposes the unimmunized newborn children to develop NNT. In other similar studies, additional factors that result in the high prevalence of NNT include harmful cultural practices of caring for the umbilical cord such as hot fomentation, application of charcoal^{15,16,17}. Still, the high proportion of mothers who gave birth to newborn babies and did not treat the umbilical cord of the babies could explain reason for the high prevalence of NNT in the northeastern part of Nigeria¹¹.

Additionally, the significant differences that existed between the provinces in the frequency of cord treatment could be explained by the differences in socioeconomic and cultural practices between various communities in the six provinces in the region as well as differences in the availability of health facilities⁶.

Conclusion(s)

Considering the fact that Nigeria remains among the 25 countries still unable to eradicate NNT, there is need for the government and other stakeholders to show increase commitment to achieve the 2015 elimination deadline. In addition to ensuring that all women of childbearing age get immunized with the tetanus toxoid to lifelong immunity, all expectant mothers and TBAs must be educated on caring of the umbilical cords of newborn children in a hygienic manner.

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Abbreviation(s)

NNT - Neonatal Tetanus

ANC - Antenatal Care

TBA - Traditional Birth Attendants

NPHCDA - National Primary Health Care Development Agency

SPSS - Statistical Package for the Social Sciences

TT - Tetanus Toxoid

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Illustrations

Illustration 1

Figure showing mothers that gave birth to NNT babies by umbilical cord treatment status

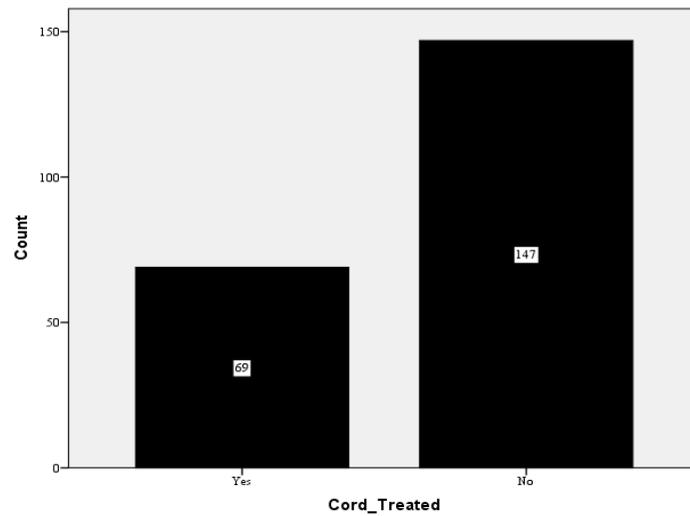


Figure showing mothers that gave birth to NNT babies by umbilical cord treatment status

Illustration 2

Table 1 : 2008 Nigeria Demographic and Health Survey (NDHS) for the North East in comparison to national figure6.

2008 Nigeria Demographic and Health Survey (NDHS): North East	Nigeria	North-East Zone
Fertility		
Total fertility rate	5.7	7.2
Women age 15–19 who are mothers or now pregnant (%)	23	39
Births that occurred less than 2 years after the preceding birth (%)	24	25
Current use of any modern method (currently married women 15–49) (%)	10	4
Maternal and Child Health		
A. Maternity care		
Women who gave birth in the last 5 years who received antenatal care from a skilled provider ¹ (%)	58	43
Births assisted by a skilled provider ¹ (%)	39	16
Births delivered in a health facility (%) [□]	35	13
B. Child immunization [□]		
Children 12–23 months fully immunized ² (%)	23	8
Children 12–23 months with no immunizations (%)	29	33
Literacy		
Literate (women 15–49/men 15–49) (%)	54/77	23/54
No education (women 15–49/men 15–49) (%)	36/19	68/45

1 Skilled provider includes doctor, nurse/midwife, or auxiliary nurse/midwife. 2 Fully immunized include BCG, measles, and three doses each of DPT and polio.

Illustration 3

Table 2: Cross Tabulation of Whether Participants

Table 2

Cross Tabulation of Whether Participants' had the Umbilical Cord of their Newborn Treated by Province

	Province						Total
	Adamawa	Bauchi	Borno	Gombe	Taraba	Yobe	
Cord Treated							
Yes	11	13	10	13	19	3	69
No	8	36	49	28	23	3	147
Total	19	49	59	41	42	6	216

Illustration 4

Table 3: Summary of Chi-squared Tests of Independence

Table 3

Summary of Chi-squared Tests of Independence

Variable	Pearson Chi-Square (χ^2)	df	Sig. (<i>p</i>)	Cramer's V
Cord Treatment	16.963	5	0.005	0.280

Reviews

Review 1

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Mahmood Isa on 25 May 2015 04:40:55 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

NA

Competing interests:

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

About 20 years of experience in the department of Community Health

Publications in the same or a related area of science: No

How to cite: Isa M. Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus [Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus' by Saleh JJ]. WebmedCentral Public Health 1970;6(5):WMCRW003223

Review 2

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Margee Peter on 25 May 2015 02:57:02 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

A nice piece and timely especially that the global NNT elimination target is 2015

Competing interests:

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

At least 10 years post specialization working experience

Publications in the same or a related area of science: No

How to cite: Peter M.Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus[Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus ' by Saleh J].WebmedCentral Public Health 1970;6(5):WMCRW003222

Review 3

Previous Version: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Isa Muhammed on 16 May 2015 09:29:02 AM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 9

Comment:

No

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

Over 20 years of clinical practice, and at least 10 years in child survival area

Publications in the same or a related area of science: No

How to cite: Muhammed I. Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus [Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus' by Saleh J]. WebmedCentral Public Health 1970;6(5):WMCRW003216

Review 4

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by [Dr. Ahmad Abdallah](#) on 14 May 2015 05:53:03 AM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

NA

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

I am a currently a consultant public health physician with at least 15 years in practice.

Publications in the same or a related area of science: No

How to cite: Abdallah A.Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus[Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus ' by Saleh J].WebmedCentral Public Health 1970;6(5):WMCRW003215

Review 5

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Zahra Sulaiman on 13 May 2015 10:02:47 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

It is my believe that manuscripts of this nature should undergo peer review.

Invited by the author to make a review on this article? : No

Experience and credentials in the specific area of science:

I am an Epidemiologist/Public Health Physician

Publications in the same or a related area of science: No

How to cite: Sulaiman Z.Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus[Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus ' by Saleh J].WebmedCentral Public Health 1970;6(5):WMCRW003214

Review 6

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Weidong Zhang on 11 May 2015 01:23:44 AM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 7

Comment:

the author should give us more information about the demographic characteristics of samples, and discuss more about NNT in the similar settings in Negeria and/or in sub-sahara africa

Invited by the author to make a review on this article? : Yes

Experience and credentials in the specific area of science:

public health researcher in China

Publications in the same or a related area of science: No

How to cite: Zhang W. Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus [Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus' by Saleh J]. *WebmedCentral Public Health* 1970;6(5):WMCRW003212

Review 7

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Sanaa Rizvi on 10 May 2015 08:31:45 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

It would be glad to give a peer review if need be.

Invited by the author to make a review on this article? : No

Experience and credentials in the specific area of science:

I am a Paediatrician.

Publications in the same or a related area of science: No

How to cite: Rizvi S.Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus[Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus ' by Saleh JJ.WebmedCentral Public Health 1970;6(5):WMCRW003211

Review 8

Review Title: Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus

Posted by Dr. Hadiza Musa on 09 May 2015 01:56:20 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 9

Comment:

No

Invited by the author to make a review on this article? : No

Experience and credentials in the specific area of science:

I have at least 10 years experience working as a Consultant Paediatrician.

Publications in the same or a related area of science: No

How to cite: Musa H.Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus[Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus ' by Saleh JJ].WebmedCentral Public Health 1970;6(5):WMCRW003210

Review 9

Review Title: Neonatal tetanus and the Impact of hygienic caring of the umbilical cord towards its prevention

Posted by Dr. Ahmed Modibbo on 08 May 2015 04:47:25 PM GMT

1	Is the subject of the article within the scope of the subject category?	
2	Are the interpretations / conclusions sound and justified by the data?	
3	Is this a new and original contribution?	
4	Does this paper exemplify an awareness of other research on the topic?	
5	Are structure and length satisfactory?	
6	Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?	
7	Can you suggest any reductions in the paper, or deletions of parts?	
8	Is the quality of the diction satisfactory?	
9	Are the illustrations and tables necessary and acceptable?	
10	Are the references adequate and are they all necessary?	
11	Are the keywords and abstract or summary informative?	

Rating: 8

Comment:

I strongly believe that there is need for this rich paper to undergo peer review to give credence to the author and also enable scholars to cite the paper as a peer reviewed article.

Invited by the author to make a review on this article? : No

Experience and credentials in the specific area of science:

I am a specialist in Paediatric Infectious Diseases

Publications in the same or a related area of science: No

How to cite: Modibbo A. Neonatal tetanus and the Impact of hygienic caring of the umbilical cord towards its prevention [Review of the article 'Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus' by Saleh J]. WebmedCentral Public Health 1970;6(5):WMCRW003209