

RESEARCH ARTICLE

Phytomedicines used for the treatment of perineal laceration among the Karbi tribe of Assam, India

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Abstract

Traditional medicines are the main source of primary healthcare among the Karbi tribe of Karbi Anglong district of Assam for the treatment of perineal laceration. Data were collected from randomly selected participants of the remote localities through interviews (semi structured and unstructured interviews) and group discussions from 37 informants (Female =30; Male = 7). 12 informants were Traditional Birth Attendants (TBAs) exclusively women, 7 were male who assist during child birth, 5 informants were elderly mothers who got their child delivered in the hand of birth attendant and the rest 13 informants were women with different occupations having knowledge of medicinal plants used for treatment of perineal laceration. Importance of the medicinal plants used among the tribe were quantitatively analysed by using various ethnobotanical indices viz. RFC (Relative Frequency of Citation), Fidelity Level (FL in %), Important Value (IVs) and Frequency of the plant part harvest (F). The study revealed the use of 9 medicinal plants (7 genera with 9 species) belonging to 4 families in the management of perineal laceration. Most of the medicinal plants were reported with highest RFC of 1 while two plants *Pogostemon benghalensis* (Burm. f.) Kuntze. and *Clerodendrum infortunatum* L. has been recorded with least RFC with 0.56 and 0.51 respectively. Maximum FL of 100% has been recorded which indicates the importance of the plant species for the treatment of perineal laceration. Traditional birth attendant and elderly women were found to play an important role in child birth and healing of perineal wound through application of phytomedicines.

Keywords: Karbi Tribe; Medicinal Plants; Perineal Laceration; Phytotherapy Remedies; Traditional Birth Attendants

1. Introduction

Phytotherapy uses preparations of medicines from plants such as macerates, infusions, decoctions, tinctures, extracts, fresh or fermented juices, and powders which are developed as herbal products for treatment of various ailments (Grigoriu et al., 2021). Plant products are very popular ingredients found in the traditional medicines use among the folk population mainly due to easy availability, cheap and affordable with lesser side effects. Many such products are used for management of gynaecological problem including parturition, postpartum ailments, birth control or even terminating unwanted pregnancy (Hedge et al., 2007; Buragohain, 2008). Traditional medicines have been reported as primary source of rural health care among the Karbi tribe in Assam mainly residing in Karbi Anglong district (Phangcho, 2001; Teron et al., 2013). Management of gynaecological problem by using phytomedicines are popular among the Karbi tribe. Vaginal delivery is common among rural women; however, the vagina or birth canal tends to stretch during vaginal delivery of child, thereby leading to wounds or laceration. Perineal laceration is a vaginal tearing or trauma on the perineum during child birth (Ramar and Grimes, 2023). The perineal laceration (wound) is managed through phytotherapy remedies among the rural folk. The Karbi women living in remote villages are dependent on Traditional Birth Attendant (TBA) for childbirth. TBAs comprises mostly of elderly women, locally called a *Sarpis* (Teron et al., 2011) and they have been reported to possess insightful knowledge and wisdom for performing safe delivery of child at home.

Previously, the reproductive health care of women through application of phytomedicines have been reported from various ethnic communities of India (Purkayastha, 2005; Vidyasagar, 2007; Hedge et al., 2007; Buragohain, 2008; Das et al., 2015; Balamurugan et al., 2017; Surendran et al., 2023). A few studies about ethnomedicines pertaining to management of gynaecological disorder have been reported from Karbi tribe (Borthakur, 1976, 1981, 1997; Teron, 2011; Terangpi et al., 2014, 2021). Management of perineal laceration through phytotherapy remedies among the Karbi tribe was found to be least reported in scientific literature.

Present study focused on applications of traditional phytomedicines used for healing the vaginal laceration among the Karbi women during child birth.

2. Material and method

2.1. Study area and data collection

Traditional child delivery and perineal laceration treatment methods using phytotherapy remedies was surveyed during the year 2019 - 2023 in the remote areas of Karbi Anglong district of Assam, India. Karbi Anglong is one of the largest hill districts located in the central Assam which is primarily dominated by Karbi ethnic community. The data were randomly collected from local traditional knowledge holders in remote villages of the district, using semi-structured questionnaire format and open-ended group discussion method. Prior Informed Consent (PIC) were obtained from traditional herbal healers and child birth attendant from remote villages. A total of 37 informants belonging to age group between 27-79 years were identified and interviewed. Traditional Birth Attendants (TBAs) were mainly interviewed as they possess traditional child birth and herbal knowledge for safe delivery of child at home. The information shared by the local informants were recorded in the field notebook. Medicinal plant species used for the treatment of perineal laceration were collected from the community forest area with the help of herbalist specialized in child birth. The medicinal plant species collected were identified by consulting standard taxonomic literatures (Kanjalil, 1934; Balakrishnan, 1981; Sharma, 1997; Patiri and Borah 2007). Accepted name of the plants were verified in POWO (<https://powo.science.kew.org/>). Importance of the medicinal plants used by the Karbi traditional birth attendants and herbalists were quantitatively determined by using various indices like Relative Frequency of Citation (RFC), Fidelity Level (FL), IVs (Important Value) and Frequency (F) of the plant part harvested and used.

2.2. Demographic of the informant and medicinal plant utilization knowledge

A total of 37 informants with different occupations were interviewed and out of which 12 of the informants were exclusively birth attendants, 07 informants were male who present during child birth and accompany their female counterparts and have the knowledge of medicinal plants. Most of the male informants interviewed were priest, charmer who are invited by the family member of woman to do some ritual and invoke deities for carrying out safe delivery of the child and overall blessing and good fortune of the child and mother in particular and her family in general. 13 of the female informants interviewed were herbalist with sound knowledge about medicinal plants utilized for the same purpose while 5 informants were mothers who usually assist birth attendant during child delivery (Table 1). The lowest age group of informants interviewed were 27 years old while the highest age group informants interviewed were 79 years old. Three informants of age 89, 97 and 102 were picked up as recommended by the village head, locally called *Rongasar*.

2.3. Quantification of ethnobotanical data using indices

In order to determine the degree of importance of medicinal plants for a particular ailment, following ethnobotanical indices were employed:

2.3.1. Relative frequency of citation (RFC)

Relative frequency of citation (Tardio, 2008) was obtained by dividing the frequency of citation (FC) (the number of informants reporting the use of species) by the total number of informants participating in the survey (N).

$$RFC = FC / N$$

2.3.2. Fidelity Level (FL)

The FL was employed to determine the most important plant species used for treating certain diseases by the local herbal practitioners and elderly people living in the study area (Alexiades, 1996). The FL was calculated using the following formula:

$$FL(\%) = N_p / N \times 100$$

Where N_p is the number of informants that mentioned the specific plant species used to treat certain ailments, and N is the total number of the informants who utilized the plants as medicine for treating any given ailment.

2.3.3. Importance Values (IVs)

Important Values (Byg and Balslev, 2001) measures the proportion of informants who regard a species as the most important. It is calculated as:

$$IVs = nis / n$$

Where, nis = No. of informants who considers the species important; n = total no. of informants.

2.3.4. Frequency of exploited plants parts (F)

The frequency of the plant parts harvest (F) was evaluated through the response rate by type of plant part harvested by using the formula (Dembele, 2015):

$$F = S/N \times 100 \text{ where}$$

S: the number of informants who responded positively to use a plant part;

N: the total number of informants.

F = 0 indicates that the plant part is not used; F is 100 when the part is used by all informants.

Result and discussion

Herbalists were found to have sound knowledge about medicinal plants used for treatment of perineal laceration among the Karbi women during child birth. A total of 09 medicinal plants belonging to 07 genera and 04 families were reported to be used in management of perineal laceration. Botanical names, part use and mode of use of the phytomedicines are presented in Table 2. The

majority of the informants interviewed were in agreement with efficacy of the ethnomedicinal plants used for the treatment of perineal laceration after child birth. Tender twigs, tender leaves and rhizome were the important plant parts used for the treatment of the perineal laceration. Raw extract and topical application were the preferred mode of medication. Two plant species, namely, *Inula cappa* (Buch.-Ham. ex D. Don) DC and *Pogostemon benghalensis* (Burm. f.) Kuntze. were used as vegetables. The later plant was reported to have therapeutic effect, provide strength and stamina to the patient with perineal laceration. *Curcuma* species were reported to provide a cooling effect during healing of wound. During the course of healing of vaginal wounds, itching and allergy tend to develop which seem to be unbearable for some women. To reduce the itching, some women applied baked leaves of *Clerodendrum infortunatum* L., in warm condition which are continued till the itching is completely under control. Among the nine medicinal plants species reported, *Chromolaena odorata* (L.) R.M. King & H. Rob., *Curcuma longa* L., *Paederia foetida* L. and *Mikania scandens* (L.) Willd. were found available for quick collection and utilization. However, the choice of selection of phytomedicines depends on the availability of plant in their locality as well as efficacy provided by the plants. Preferences and importance of phytomedicines are quantitatively determined which is presented in Table 3. Two plants species, namely, *Pogostemon benghalensis* (Burm. f.) Kuntze. and *Clerodendrum infortunatum* L., has showed least RFC with 0.56 and 0.51 while most of the plant species has RFC of 1 respectively which indicates the frequency of citation of the plant species. The FL was employed to determine the most important medicinal plant species used for treating certain diseases by the local herbal practitioners and elderly people living in the study area (Alexiades, et al., 1996). The study shows that the recorded plant species were considered as most important since it has demonstrated maximum FL value of 100. The important value (IVs) of all the recorded plant species has been reported to be 1 which implies importance of the medicinal plant species used for multiple purposes along with treatment of particular ailment.

In most rural areas, child delivery are normally done at home with the assistance of traditional birth attendant (TBAs) who assist women during normal delivery of her child. They also give emotional and moral support before and after parturition. In the absence of modern healthcare centre in the rural locality, pregnant women have to depend on traditional birth attendants and herbalists. Majority of the women and some expecting mothers reported that they feel safe and comfortable to deliver child with assistance of TBAs. TBAs were exclusively women, mostly the elderly menopause who have the experience and knowledge in managing pregnancy and other female related health issue (Terangpi, 2014). Presence study has demonstrated constant dependency rural folk on phytomedicines for treatment of perineal laceration developed during post-delivery of child in some women. After normal delivery, most woman experienced trauma since the perineum tear is painful and bring discomfort to the woman. However, the birth attendant and other elderly women provide psychological and physical support. The perineal laceration is generally cleaned regularly using lukewarm water, allow it dry and apply extracts of phytomedicines. Although, wounds or laceration tend to heals naturally but the application of phytomedicines accelerates the natural healing process without side effect. *Inula cappa* (Buch.- Ham. ex D. Don) DC., was found to be used as medicines as well as vegetables since it is believed to provide to physical strength and have postpartum effect. Kalola et al (2017), has reported the use of *I. cappa* (root) as a potent anti-inflammatory agent. All the plant medicines reported in the present study were found to be used individually; while preferences of the application of plants medicines depend on the local availability or as prescribed by the herbalist. Quantification of data using certain indices explains the degree of importance of medicinal plant species found in locality for treatment of particular ailment. Most of the phytomedicines reported in the present study have been reported to have demonstrated pharmacological potentialities. *Inula* has been reported as potent wound healing and anti-inflammatory agent (Kalola et al., 2017). *Curcuma* sp. has been reported to have potent wound healing and anti-inflammatory properties (Akbiq, 2014; Jurenka, 2009); *Mikania scandens* was reported as potential wound healing agent (Sumantri et al., 2021; Das et al., 2023) while *Paederia* sp. has been reported



Figure 1A. *Curcuma aromatica* Salisb. [Zingiberaceae]; **B.** Rhizome of *Curcuma aromatica* Salisb.; **C.** Rhizome of *Curcuma longa* [Zingiberaceae]; **D.** *Mikania scandens* (L.) Willd. [Asteraceae]; **E.** *Clerodendrum infortunatum* L. [Lamiaceae]; **F.** *Chromolaena odorata* (L.) R.M King & H.Rob. [Asteraceae]; **G.** *Paederia foetida* L. [Rutaceae].

as anti-ulcer and anti-inflammatory agents (Das et al., 2013, Sharma et al., 2023).

Conclusion

The study reported that the Traditional birth attendants play a crucial role in ensuring safe delivery of child at home in Karbi society while the traditional healers play a key role in effective treatment of perineal laceration of women after child birth. Phytomedicines formulations are derived from a single species or a combination of more than two species. Mode of applications are all topical and the plants used for perineal lacerations have been reported as potent anti-inflammatory and wound healing properties. Further investigation may be required using phytochemistry tools and methods to unveil the phytochemicals with healing properties.

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Contribution of the authors

First author, Reena Terangi contributed in the data collection, and identification of plant; analysed the data and drafting of the manuscript; Second author, Farishta Yasmin involved in the research design, language editing, interpretation and cross-

checked the data. All authors read and approved the final manuscript.

Conflict of interest

The authors declared that there is no conflict of interest.

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Table 1. Informant Demographic characteristics

| SN | Name of informant | Age/Sex | Occupation | Remarks |
|----|---------------------------|---------|---|---|
| 1 | <i>Kareng Rongpipi</i> | 89 F | Birth attendant | Specially picked up as informant as per <i>Rongasar</i> suggestion. |
| 2 | <i>Kadom Rongpipi</i> | 102 F | Birth attendant, specialist in woman reproductive health, herbalist. | Specially picked up as informant as per <i>Rongasar</i> suggestion. |
| 3 | <i>Amphu Terangpi</i> | 97 F | Female reproductive health expert, herbalist. | Specially picked up as informant as per <i>Rongasar</i> suggestion. |
| 4 | <i>Kareng Derapi</i> | 69 F | Birth attendant | |
| 5 | <i>Kareng Ingtipi</i> | 63 F | Birth attendant, herbalist. | |
| 6 | <i>Basapi Ronghangpi</i> | 73 F | Birth attendant, charmer, herbalist. | |
| 7 | <i>Kave Timungpi</i> | 78 F | Birth attendant, charmer, herbalist. | |
| 8 | <i>Sika Rongpipi</i> | 69 F | Birth attendant, charmer. | |
| 9 | <i>Kareng Engtipi</i> | 67 F | Birth attendant, charmer, herbalist. Specialist woman reproductive health | |
| 10 | <i>Kanam Senarpi</i> | 72 F | Birth attendant, herbalist, specialist in woman reproductive health. | |
| 11 | <i>Basapi Terangpi</i> | 79 F | Birth attendant, herbalist, specialist in woman reproductive health. | |
| 12 | <i>Homsira Tokbipi</i> | 79 F | Birth attendant | |
| 13 | <i>Thibong Ronghangpi</i> | 27 F | Housewife | Parturition at home |
| 14 | <i>Kamir Terangpi</i> | 31 F | Housewife | Parturition at home |
| 15 | <i>Jyostna Teronpi</i> | 35 F | Housewife | Parturition at home |
| 16 | <i>Sabitri Phangchopi</i> | 29 F | Housewife | Parturition at home |
| 17 | <i>Meena Timungpi</i> | 38 F | Housewife | Parturition at home |
| 18 | <i>Kajek Ronghangpi</i> | 60 F | Housewife, herbalist | |
| 19 | <i>Sika Ronghangpi</i> | 60 F | Housewife, herbalist | |
| 20 | <i>Basa Englengpi</i> | 48 F | Herbalist | |
| 21 | <i>Charhe Hansepi 80Y</i> | 70 F | Housewife, herbalist | |
| 22 | <i>Kadom Rongpipi</i> | 63 F | Charmer | |
| 23 | <i>Kabon Engtipi</i> | 57 F | Wild edible plants seller | |
| 24 | <i>Khirla Terangpi</i> | 70 F | Herbalist | |
| 25 | <i>Dinimai Kropi</i> | 68 F | Housewife; Herbalist | |
| 26 | <i>Binita Timungpi</i> | 37 F | Wild plants gatherer | |
| 27 | <i>Sangpi Timungpi</i> | 64 F | Herbalist | |
| 28 | <i>Harlin Hansepi</i> | 48 F | Wild food/medicinal plants gatherer | |
| 29 | <i>Langmir Timungpi</i> | 64 F | Gatherer of forest products/herbalist | |
| 30 | <i>Ka et Ronghangpi</i> | 67 F | Herbalist | |
| 31 | <i>Sarthe Rongpi</i> | 70 M | Wild plants gatherer | |
| 32 | <i>Dilip Rongpi</i> | 65 M | Wild plants gatherer | |
| 33 | <i>Ra Rongpi</i> | 69 M | Herbalist, Priest, Charmer, wild plant gatherer | |
| 34 | <i>Rajen Kro</i> | 73 F | Medicinal plants collector | |
| 35 | <i>Sing Singnar</i> | 71 M | Wild plant gatherer, vendors, herbalist | |
| 36 | <i>Khorsing Terang</i> | 75 F | Priest, charmer | |
| 37 | <i>Sarthe Kro</i> | 59 M | Gardener, Wild food plants vendor, herbalist | |

Table 2. Medicinal plants used for perineal laceration.

| SN | Botanical Name, Family, Vernacular Name | Part Use | Traditional Usage | Other use reports |
|----|---|--------------------------------|---|---|
| 1 | <i>Inula cappa</i> (Buch.-Ham. ex D. Don) DC [Asteraceae], <i>Chulumpui</i> | Tender leaves | Leaf extract is applied on wound with the help of quill | Anti-inflammatory (Kolala, 2017). |
| 2 | <i>Chromolaena odorata</i> (L.) R.M. King & H.Rob. [Asteraceae], <i>Bap bongnai</i> | Tender twigs | Twigs extract or paste applied locally on the wound | Active wound healing (Sirinthipaporn, 2017) |
| 3 | <i>Pogostemon benghalensis</i> (Burm. f.) Kuntze. (Lamiaceae), <i>Han bipo</i> | Tender twigs | Extract applied locally on the wound | Antipyretic, Antinociceptic, Anti-inflammatory (Aryal et al., 2019). |
| 4 | <i>Mikania scandens</i> (L.) Willd. [Asteraceae], <i>Bap bongnai phulok</i> | Tender twigs | Extract applied locally on the laceration | Active wound healing properties (Sumantri, 2021). |
| 5 | <i>Curcuma aromatica</i> Salisb. [Zingiberaceae], <i>Habit Tharmit</i> | Fresh rhizome | Fresh rhizome is grounded into paste and applied on the laceration for a cooling effect | Wound healing activity (Kumar, 2009). |
| 6 | <i>Curcuma longa</i> L. [Zingiberaceae], <i>Tharmit keme</i> | Fresh rhizome | Fresh ground rhizome applied on the laceration | - |
| 7 | <i>Clerodendrum infortunatum</i> L. [Lamiaceae], <i>Mahar alosam</i> | Leaves | Baked leaves applied on healing wound to stable itchiness | - |
| 8 | <i>Paederia foetida</i> L. [Rutaceae], <i>Rikang nemthu</i> | Tender twigs and trailing stem | Extract applied locally on the wound | Anti-inflammatory (Das, 2013); Trailing stem used as abortifacient (Terangpi, 2021) |

Table 3. Quantitative estimation of medicinal plants.

| SN | Botanical Name | Parts used | RFC | FL (%) | IVs | F |
|----|--|---------------|------|--------|-----|-----|
| 1 | <i>Inula cappa</i> (Buch.-Ham. ex D. Don) DC | Tender leaves | 1 | 100 | 1 | 100 |
| 2 | <i>Chromolaena odorata</i> (L.) R.M. King & H.Rob. | Tender twigs | 1 | 100 | 1 | 100 |
| 3 | <i>Pogostemon benghalensis</i> (Burm. f.) Kuntze | Tender twigs | 0.56 | 100 | 1 | 56 |
| 4 | <i>Mikania scandens</i> (L.) Willd. | Tender twigs | 1 | 100 | 1 | 100 |
| 5 | <i>Curcuma aromatica</i> Salisb. | Rhizome | 1 | 100 | 1 | 100 |
| 6 | <i>Curcuma longa</i> L. | Rhizome | 1 | 100 | 1 | 100 |
| 7 | <i>Clerodendrum infortunatum</i> L. | Leaves | 0.51 | 78 | 1 | 51 |
| 8 | <i>Paederia foetida</i> L. | Tender twigs | 1 | 100 | 1 | 100 |

RFC= Relative frequency of citation; FL=Fidelity Level; IVs= Important Values; F= Frequency of Exploited plant parts

