

UPDATE IN PRIMARY CARE

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G. LO IACONO*, A. TRIZZINO**,
R. BUZZETTI***

* Pediatra di famiglia, Palermo;

** Pediatra in formazione, Palermo;

*** Pediatra epidemiologo, Bergamo

Umbilical cord care at birth: commonplace, traditions and EBM in family paediatrics

La cura del cordone ombelicale alla nascita: luoghi comuni, tradizioni ed EBM in pediatria di famiglia

SUMMARY

Generally, pregnant mothers question the family paediatrician about umbilical cord care after the baby's birth. Through the Evidence Based Medicine, the authors have converted the need for such information into answers, search for evidence in online bibliographic database, critically analyze the scientific research and answer the patient's questions, taking into account the patient's family context.

RIASSUNTO

Una madre gravida pone un quesito al pediatra di famiglia riguardante la cura del moncone ombelicale del suo prossimo figlio. Attraverso le tappe dell'Evidence Based Medicine gli autori definiscono il quesito clinico, cercano le prove di efficacia, le analizzano criticamente e danno una risposta clinica alla paziente tenendo conto del contesto nel quale nascerà il bambino.

Key words

Cord • Topical umbilical cord care • Topical • Umbilical cord • Umbilical cord care

Parole chiave

Cordone ombelicale • Topici per la cura del cordone ombelicale • Cura del cordone ombelicale

INTRODUCTION

Everyday family paediatricians have to solve many clinical problems and have to answer many questions posed by the parents.

How can family paediatricians provide scientifically-sound and adequate answers to these questions?

1. Convert information need into answerable questions
2. Identify the best evidence with maximum efficiency
5. Critically appraise that evidence
6. Apply in clinical practice
7. Evaluate the performance

David Sackett

The approach we used is very close to the one used by Critically Appraised Topics (CAT). «CATs are a tactic for helping clinical learners teach themselves how to formulate clinical questions; search for the best evidence; appraise, organise and summarise this evidence; integrate it with clinical expertise; and practice evidence-based medicine. When generated by clinical teams, journal clubs, or in academic half-days, their educational value is multiplied»¹.

In a family paediatrician office

Georgia's mother is expecting a baby. She goes to the family paediatrician office to examine Georgia, before the imminent birth.

«Doctor, would you clarify my views about a question: after my second baby's birth, how should I care for his umbilical cord?»

When Georgia was born the neonatologist prescribed to disinfect the umbilical cord with ethyl alcohol and sterile heron; my sister, who had a baby just two months ago, used an antibiotic powder; in a consumer's medical magazine the paediatrician recommended to disinfect the umbilical cord with silver sulphadizine. Other paediatricians recommend to use salicylic sugar powder and I know that some doctors recommend only to Keep it clean and dry!

Doctors have always different opinions: it is very difficult to understand which is the best thing to do for our children!».

BACKGROUND

Umbilical cord (UC) infection caused many neonatal deaths before the advent of asepsis. In developing countries, babies continue to die from cord sepsis. Contamination of the cord in deprived populations sometimes results in neonatal tetanus². Different methods of caring for the UC after delivery have come in and out of fashion over the years in an effort to reduce the risk of neonatal infection³. The World Health Organization and others emphasise good hygiene at delivery, and promote good cord care practice. However, recommendations

for cord care are often based on traditional assessments of published literature and opinion ².

In the 1940s, the introduction of nurseries in hospitals increased the risk of colonization and infections in developed countries as well. Consequently, the application of rigorous clean cord care programs became necessary at birth, during hospitalization and upon discharge. In 1998, the WHO established cord care recommendations at birth and after discharge from hospital that are currently observed in developed countries. A thorough hand-washing constitutes an important measure in the prevention of cord stump contamination, but the tendency of medical and paramedical attendants to perform this simple hygienic procedure is notoriously low. This is the reason why several authors recommend the application of an antiseptic on the UC regardless. Although the American Academy of Paediatrics considers no antiseptic treatment to be superior to any other, they confirm its utility. Finally, the WHO established that in hospital nurseries it is probably best to apply a topical antimicrobial to the cord stump after cutting the cord, and once a day for the first three days. It is important to remember, however, that antiseptic treatment delays cord detachment and that consequently, the cost of postnatal care may unnecessarily increase ^{4,5}.

A survey poll carried out between family paediatricians and neonatology departments in our territory confirmed that everyone has a different behaviour: alcohol, hydrogen peroxide, micronised silver sulphadizine, keeping UC clean and dry, mercurochrome, mercurochrome and hydrogen peroxide together, salicylic sugar powder.

Aim of this research

Recommendations about UC care are often based on personal opinions and traditions.

Our aim was to look for evidence about UC care.

Clinical queries

The first step in Evidence Based Medicine is clinical query formulation.

We have to convert the mother's anxiety and perplexity about so many different methods to care for UC into clinical queries.

Is topic treatment in UC care after delivery better than doing nothing, in developed countries?

If so, what are the best topic, therapy time and frequency?

These queries are not complete. We have explained what the intervention (topic treatment) and comparison (doing nothing) are; to further understand, we have to identify the *outcome* and the *population*, then we have to formulate a query for every problem. Primary outcomes are: reduction of mortality due to systemic infections, reduction of local and systemic infections. Secondary outcomes are: U.C. detachment time, bacterial colonization, mother's worry / satisfaction, care cost. Population is «newborn after delivery in developed countries». Now we can better focus our queries:

- Does the use of antiseptics or antibiotics or other topic treatment in UC care in newborns significantly reduce the number of deaths compared with simple cleansing/drying?
- Does the use of antiseptics or antibiotics or other topic treatment in UC care in newborns significantly reduce the number of infections compared with simple cleansing/drying?
- Does our intervention in UC care in newborns reduce bacterial colonization compared with simple cleansing/drying?

- Does our intervention in U.C. care in newborns influence UC detachment time compared with simple cleansing/drying?
- Is there any difference in the above mentioned outcomes using one preparation instead of another in UC care in newborns?
- Is there any difference in the above mentioned outcomes changing therapy time or frequency of therapy in UC care in newborns?

Research strategy

Three on-line searches on electronic literature databases were made looking for all publications in every languages.

We searched Medline <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi> from January 1966 to May 2002, using as key words: cord, umbilical cord, umbilical cord care, topical umbilical cord care, umbilical stump and cord separation time. When we restricted the search to randomised controlled trials (RCT), we found 15 reports. The Controlled Trials Register of the Cochrane Library and the Cochrane database of systematic reviews were also searched (<http://www.update-software.com/clubng/clublogon.htm> and <http://www.update-software.com/abstracts/mainindex.htm>).

We found a systematic review published in January 2002 ². All studies retrieved were included in this review except for a randomised controlled trial published after the preparations of the review ⁵. The reference lists of all selected articles were also examined for relevant studies.

Selected articles

- A) Zupan J, Garner P - *Topical umbilical cord care at birth - The Cochrane Library, Issue 1, 2002.*

C) Pezzati M, Biagioli EC, Martelli E, Gambi B, Biagiotti R, Rubaltelli FF. - *Umbilical cord care: the effect of eight different cord-care regimens on cord separation time and other outcomes. Biol Neonate* 2002 Jan;81(1):38-44

Results

A) Zupan J, Garner P - *Topical umbilical cord care at birth - The Cochrane Library, Issue 1, 2002. - (Cochrane Review)*

Zupan's systematic review analysed ten randomised clinical trials (RCT). Two reviewers considered published scientific works obtained from systematic searching of literature but also unpublished works (?? Not clear). Randomisation was evaluated according to the following scale:

- A (opaque envelopes, independent random number generation)
- B (where the authors described them as randomised without providing further details);
- C (where the allocation used other quasi-random methods, such as alternation).

Seven clinical trials were graded as «B», two as «C» and only one as «A».

Similar unquoted scales have been applied to other methodological items, for example blinding.

The authors explained the reasons of exclusion of some trials.

They worked separately and independently: when the judgment was different a third person was consulted.

They classified some works as awaiting assessment but they didn't explain the reason. They asked for the RCT authors' help to have as many unpublished data as possible.

Population

- All RCT were carried out in developed countries. We found only case control studies carried out in developing countries

- All RCT considered healthy term infants

- All RCT considered newborn who were born in hospital

- Randomised clinical trials were carried out for a long time: before 1980, newborns stayed in nurseries, after 1980 rooming-in was practised. This makes a difference in UC colonization

- There were no sufficiently large studies to examine outcomes in terms of serious neonatal infections.

Intervention

«1. Any topical antiseptic application, including alcohol, triple dye, silver sulphadiazine, acraflavine, iodine, and chlorhexidine, and gentian violet versus no antiseptic or versus another antiseptic. 2. Any topical antibiotic application, including bacitracin, nitrofurazone, or tetracycline versus no antibiotic. 3. Application of powders with or without antiseptic. 4. Single versus multiple applications to the cord. 5. Washing the whole baby versus dry care. 6. Care of the cord versus no care of the cord»².

Outcomes

All RCT concluded that no serious infections or death occurred; most of them did not mention light UC infections.

Most RTC did not report significant differences for primary outcomes.

Differences between trials were evaluated by secondary outcomes: UC detachment time, bacterial colonization, mother's anxiety. Only one RCT analysed the costs of therapy.

Only two RCT considered a six-week follow-up; others stopped observation when UC detached, probably missing some UC infections.

Conclusion

1. no systemic infections or deaths were observed in any of the studies reviewed
2. cord infection within 6 weeks of observation was not affected by use of antiseptics

3. studies in which nothing was applied to the cord had mean separation times of about 8 days; with powders it was about 7 (only Mugford); with alcohol it was about 10 (two studies); with antibiotics about 12 (two studies); with silver sulfadiazine 10.6-13.8; triple dye 7.7-15.7
4. hydrophobic bandage has no significant effect on cord separation, bacterial colonisation, or U.C. infections
5. use of antiseptics was associated with a reduction of maternal concern about the cord
6. colonization was reduced with antiseptic use, with a trend to reduced colonization with staphylococcus aureus when antibiotics were used compared with antiseptics, but clinical significance of skin colonization is not known.

B) Pezzati M, Biagioli EC, Martelli E, Gambi B, Biagiotti R, Rubaltelli FF. *Umbilical cord care: the effect of eight different cord-care regimens on cord separation time and other outcomes. - Biol Neonate* 2002 Jan; 81(1):38-44

This clinical trial evaluates the effect of eight cord-care regimens (70% Alcohol, Natural drying, Neomycin-bacitracin (Cicatrene®), Colloid silver benzyl (Katoxin®), Green clay powder 1%, basic fuchsine, Salicylic sugar powder, Tryple day.) on cord separation time and other secondary outcomes (omphalitis, sepsis, death, cord bleeding, compliance, satisfaction or dissatisfaction with regard to the type of treatment, umbilical cord colonization) on 1535 healthy term infants. It is a prospective controlled trial; authors used different treatments, changing them monthly.

Authors conclude that:

- the use of antiseptic powders is related to a shorter cord separation time (Salicylic sugar powder (SSP) 5.6 ±

2.3 days ; Neomycin-bacitracin 9.5 ± 3.1) than with antiseptic liquids (70% Alcohol 16.9 ± 7.5 days) and emphasises the important role of dehydration in cord detachment (the extreme effectiveness of medicament in powder form (SSP) is probably related to the combination of the following two substances: the cheratolitic effect of salicylic acid and the dehydrating action of sugar);

- the importance of dehydration is confirmed by the relatively fast cord detachment in the group of newborns treated with natural drying (7.5 ± 3.1 days);

- when detachment time was shorter, there was a more frequent occurrence of cord scar bleeding (a light blood loss of short duration)

- the treatments associated with delayed cord detachment (70% alcohol, triple dye, fuchsine) caused the highest level of anxiety in parents;

- natural drying caused a significantly lower bacterial colonization rate (71.2%) not only compared to green clay powder but also compared to Colloid silver benzyl and fuchsine, confirming that there is no evidence that doing nothing other than keeping the cord clean is harmful;

- neomycin-bacitracin was shown to be the best both in terms of bacterial colonization and in terms of the most common umbilical infection-causing agents but the systematic topical use of antibiotics is not recommended;

- in hospital nurseries of developed countries, salicylic sugar powder can be effectively and safely used for umbilical cord care of healthy term infants.

Comment

This study is very interesting although it is flawed by the fact that it is not randomized: eight different interventions have been administered in eight subsequent months.

The monthly change of treatment could have influenced the outcome: the improvement of outcome could derive from a «period effect» (as a research study progresses, medical care, compliance and satisfaction generally improve).

These bias can be avoided by randomisation. The difficulty of randomising each subject could be resolved by randomising the sequence of treatments (for example one week for each treatment for four times). Randomisation makes the groups of participants homogeneous not only for well-known variables but also for unknown ones, ensuring that outcome is attributable only to the intervention being evaluated. Non randomised clinical trials provide weaker evidence.

Information provided over the phone by parents after six weeks could be inaccurate (recall bias).

Outcome is weak: the incidence of cord scar bleeding seems to be correlated with earlier UC detachment; are we sure that an early UC detachment is the best?

Finally, the cost of treatment is not considered: does a difference of two or three days in UC detachment justify the cost of treatment?

Conclusion

- Further RCT are needed to observe slight infections after UC detachment. Longer follow-ups

are needed. Continuity of care between neonatology departments and family paediatrics could be useful to observe newborn after discharge; however, the problem has a low clinical impact, and whether to commit human and economic resource to settle this question needs to be evaluated.

- Use of antiseptic agents for umbilical cord care reduces bacterial colonization and may inhibit leucocyte infiltration, thus delaying the separation of the cord stump^{2,5}.
- There is no evidence that shorter time of UC detachment justifies the cost of any therapy.
- In any case, we cannot apply RCT results to developing countries, to preterm infant or to unhealthy newborn.

What answer should we give our patient (Georgia's mother)?

There is no strong evidence in favour of one treatment over another, even if the treatment can reduce detachment time; we therefore think that the best advise is to apply preventive measures in the management of her new baby, watching the UC daily to prevent infection sign.

Key messages

In developed countries, there is no evidence of the need for intervention in UC care in the management of healthy term infants, provided that the recommended hygienic preventive measures are applied.

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Correspondence:
Dr. Giovanna Lo Iacono
Via Pascoli, 19
90144 Palermo, Italy
Tel. +39 91 6250371
e-mail: gianveraloiacono@libero.it