

Paediatric wound care: neonates and infants

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A brief search of the world's wound care literature using a popular database such as PubMed will yield many hits (on 1st September I had 109,809 for 'wound care') but by refining the strategy by adding 'paediatric' reduces the number dramatically (down to 3,391). What does this tell us? Perhaps it reflects a considerably smaller clinical niche, or less research, or indeed, a greater difficulty in conducting research. All three reasons will apply to a degree. By adding 'audit' to both search strategies, the numbers are reduced even further. In the case of paediatric wounds, only very few hits, and these confined to burns and other trauma.

The purpose of the current debate is to consider aspects of paediatric wound management outside of burns — this is a specialist field and not subject of consideration here. It is, therefore, a focus on issues related to patient age, pain including psychological matters, and the practicalities of wound management. We do not aim to address all of the issues, merely to draw attention to some of the more emotive and thus, important. Readers wishing to learn more are advised to consult specialist

texts, some of which are cited here, or to approach specialised centres.

As children have excellent cardiovascular reserve, are capable of intense vasoconstriction to preserve circulating volume, and have few comorbidities wound healing is generally uncomplicated. However, there are numerous considerations other than healing that must be borne in mind when treating a child. Firstly, there is an age-related component; 'paediatric' constitutes the spectrum of neonate to teenager, this is a considerable variation in both biological development of the skin, and in psychological development. The neonatal skin is immature, it matures post-natally for in its barrier, physical, and immune functions (Neimann and Watt, 2002; Chiou and Blume-Peytavi, 2004; Fluhr et al 2010; Ludriksone et al, 2014). These changing aspects of skin function in the neonate are factors in choice of topical applications, including wound treatments.

With respect to pain, it is now well-established that assessment, particularly at dressing change, is required for all wound patients most especially children. Failure to acknowledge and act on this will lead to non-compliance (Soon, 2006).

Until very recently, little or no consideration was made for the manufacture of products designed with the paediatric patient in mind. However, with the advent of soft silicone adhesives, much has changed for the better, insofar as pain at dressing change has been addressed. This is not the whole solution as can be seen from the expert comments below. Specific antimicrobials are required for example. Manufacturers will do well to take heed of the comments made in the response below, particularly in the provision of dressings of appropriate sizes. This is surely a positive economic measure.

Finally is the matter of clinical education

and practical experience. There are too few opportunities for clinicians to access educational courses, or to gain experience in the clinic. As most nurses and many physicians will, at some time, encounter a child with a wound it is highly desirable that this deficit is addressed. *Richard White*

1. Dressings for neonatal skin. Adaptation of 'adult' size dressings with few specific acknowledgements for the needs of young children in terms of sizes, adhesives, comfort, designs etc.

AR: In practice, many babies are prone to damage from skin stripping, pressure, extravasation injury etc. They may be nursed in humidity and require minimal handling. Therefore, it is often a better option to secure dressings with a loose bandage or tubular bandage to avoid the use of adhesives wherever possible.

I agree that there few specific acknowledgements for the needs of infants but due to the rise of products made with soft silicone, which are available in smaller sizes (usually designed for use in podiatry), it is less common to have to greatly adapt products or waste a lot of the product. However, it may be that we are so used to doing it that we don't even notice it any longer.

It is very important that the wound management product formulary is streamlined for neonatal care, by people with the relevant knowledge in this field, incorporating only a small number of products that are known to be 'safe' for use in this patient group.

LO: Currently the problem with dressings for children and neonates is that they do not come in small enough sizes. Manufacturing companies need to consider making dressings small enough for this population. Many times dressings have to be cut down

to size to fit the wound. Therefore once a dressing has been opened and only a small piece of it used it has to be thrown away as it is no longer sterile. This increases cost of dressing products of this population.

We have on the market various types of dressings with special adhesives which if small are fine for children and their skin type but we could do with making them look a bit more fun so that they are more acceptable to children.

DA: I have no specific expertise in this area. It is fairly obvious that dressings will be needed to be adapted but I see no papers addressing this issue. I defer to my clinical colleagues who will have first-hand experience in this area.

2. Antimicrobials: safety. We have heard the stories and read the comments on silver and iodine used in children's wounds, but how does one judge risk-benefit in this patient group?

AR: Professionals who have/are studying this topic agree that silver can be absorbed through a wound bed and deposits have been found in the brain, liver and kidneys as well as raised serum silver levels (unpublished studies). Some are of the opinion that this causes no long-term ill effects, while others think that we don't know if does or that it may cause long-term ill effects.

Advances in wound care technology mean that there are many other products available that are as effective in their antimicrobial actions as silver, i.e. medical grade honey, gels containing antimicrobial enzymes (glucose oxidase and lactoperoxidase), Polyhexamethylene Biguanide (PHMB) and products coated with dialkyl carbamoyl chloride (DACC). These products carry little or no reported risks of absorption/adverse reaction, therefore, should be

considered for inclusion in paediatric wound care formularies leaving iodine and silver-containing products for use in specific wound aetiologies such as burns/scalds where there is evidence to support their efficacy in the prevention and management of infection in this high-risk group.

LO: Antimicrobial usage and its safety apply to all patients, no matter what age they are. Within Tissue Viability, it is always about assessing the risk, this is no different with children or neonates. Staff need to be aware and understand what antimicrobials do and their absorbency/action on the tissues, so that when assessing children's wounds any risks can be taken into account. Discussion can then take place with the medical teams and parents with regards to the risk antimicrobials may pose. When using antimicrobials in this age group, we have to understand what the outcome of not treating a wound will be, what stage in their illness the children are, what the benefits of these treatments are and whether any risks taken outweigh any other risks the children may face.

DA: I can only repeat what I said for the former item on dressings. It would be helpful to get some comment from infection control specialists.

3. Pain. What attention is given/should be given to pain at dressing change and during wear in this patient group?

AR: In specialist paediatric centres, pain and anxiety management are given a very high priority as staff are well aware of the detrimental, sometimes long-term, physical and psychological effects this can have on the child and family. 'Stronger' analgesics, such as opioids, are used with confidence in doses/modes of administration known to be effective for certain ages of children

and following certain procedures. Where necessary general anaesthesia is carried out, for example, in burn/scald assessment and debridement. The use of distraction and play cannot be recommended highly enough, this may negate the need for analgesia/sedation or can be used in conjunction with medication.

Pain/anxiety should never be ignored and can be expressed in many different ways. The child's age, stage of development, cognitive impairment will all have an impact on how the pain manifests and is displayed; therefore, it is vital to ask family members their opinion as they will know what is normal for their child. Pain assessment tools are a useful adjunct but must be age/developmentally appropriate and used in context.

LO: Pain management is a priority in children's nursing. Reducing children's pain, reduces their anxiety and stress levels which in turn reduces the parents/carers fears and concerns. It is the fear of the unknown that increases children's anxieties. If the injury hurt, then the dressing will hurt when it is removed. It is essential whenever undertaking an assessment or dressing change that the aspect of pain management, dressing's removal and dressing application are addressed. The use of adhesive removers to assist dressing removal, the importance of distraction therapy and the support of play therapist can help reduce the child's anxiety when carrying out wound care. These methods to support pain management cannot be underestimated and the part individuals play in children's care. Using appropriate interventions allows the child to develop trust — an essential aspect of paediatric nursing.

DA: As above, I see no literature on this topic though colleagues will have experience to share on this topic.

4. Trials. Is there enough research into paediatric wound care or are we shying away on the perceived basis of ethics objection? Does this lead to compromised care?

AR: There is definitely a lack of research into paediatric wound care as well as wound care in general. We rely on the results of adult studies of little relevance to children as the wound aetiologies, disease processes and factors affecting healing can differ greatly.

Whether we have been declined authorisation to carry out research due to ethical objection or fail to apply for research in this field, based on perceived ethical objection, it is likely we take more risks when introducing new wound management techniques as this may be done without careful consideration and control leading to potentially compromised care.

LO: There is little available evidence within paediatric wound care. Often it is stated that it is unethical to trial dressings on children. Often products state that they can only be used on children over 1 month old. What is the difference in skin at 29 days than 30 days? We should be undertaking trials, even though a wound is the same in children and adults there is a difference with neonatal skin and its maturity. The evidence that is used for some products are case studies, we should be asking for different forms of evidence, we should be able to get around the ethical issues and change the way we think about appropriate evidence. Not having the evidence doesn't lead to compromised care as dressing products are used in neonates and children with the little evidence there is. Therefore we use these products without any robust evidence for this age range, waying up the risks of not using dressing products on the child.

DA: Ideally, as an academic you would do a systematic review to look into this. However, 'wounds' is a large topic. Systematic reviews

typically look at a very focussed area to be able to consider all relevant material and make a considered view.

There are roughly 1.7 million articles with 'children' as a Medical Subheading (MeSH) via PubMed. If you add 'wound' as a MeSH heading this goes down to about 105,000. As I cannot look at this number, I focussed on 'child' and 'pressure ulcer' as combined MeSH keywords. This gave me 367 articles. As I know a bit about pressure ulcers and can at least look at 367 titles, I thought this might give a viewpoint. After all pressure ulcers are increasingly seen as important in paediatrics and any lessons may be useful in other chronic wounds at least if not in acute ones.

Accordingly, I looked at each title and found about seventy that were ostensibly research papers directly concerned with paediatric pressure ulcers. I ignored those that had no primary data except for reviews of primary studies. These split into papers concerned with:

Incidence/prevalence. Several papers measure the number of pressure ulcers at one point — prevalence (Groeneveld et al, 2004; McLane et al, 2004; Dixon and Ratliff, 2005; Schluer et al, 2012; Schluer et al, 2014) or occurring within a period of time — incidence (Baldwin, 2002; Visscher et al, 2013). These use various methodologies and different clinical areas. There is also a systematic review of prevalence (Kottner et al, 2010).

Risk factors. Identification of risk factors using statistical methods (McCord et al, 2004; Willock et al, 2005).

Risk assessment scales. These are very common. They typically validate a scale in the sense that children with higher (or sometimes lower) scores are more likely to develop a pressure ulcer (Curley et al, 2003; Willock et al, 2009; Tume et al, 2014). Papers also evaluate reliability of scales, in particular inter-rater reliability (Willock et al, 2008; Kottner et al, 2012; Willock, 2013; Kottner et al, 2014). Some papers compare more than one scale to evaluate which is

better/best (Kwong et al, 2005; Anthony et al, 2010; Leonard et al, 2013). These can be in general paediatrics or specialist areas such as neonatal or paediatric intensive care. There is also a systematic review of scales (Kottner et al, 2013).

So the evidence on one chronic (though very important) wound — pressure ulcers — is that we probably have a good idea of how big the problem is (incidence, prevalence), we probably know the risk factors and we know that risk assessment scales measure risk and measure it reliably. We have no idea whether these scales have any effect on incidence of pressure ulcers — which is the main reason for using them.

5. National focus through journals, study days, distance learning and conferences. Is such a focus justified and, if so, on what grounds?

AR: I cannot agree with this strongly enough. In 2014, I founded the UK Paediatric Tissue Viability Nurses Group and was shocked as to how few of us there are. Membership has now been extended to those (adult) TVNs who are responsible for looking after paediatric/neonatal areas but the group remains relatively small with currently only 16 members. Although still in its infancy, I think all the members would agree that we have provided each other with invaluable advice and support over the last 2 years and although we only meet once per year have achieved a lot in that time through the production of the Best Practice Statement: Principles of Wound Management in Paediatric Patients (Rodgers et al, 2014), and hosting a half day on paediatric and neonatal wound care at the 2015 Wounds UK conference.

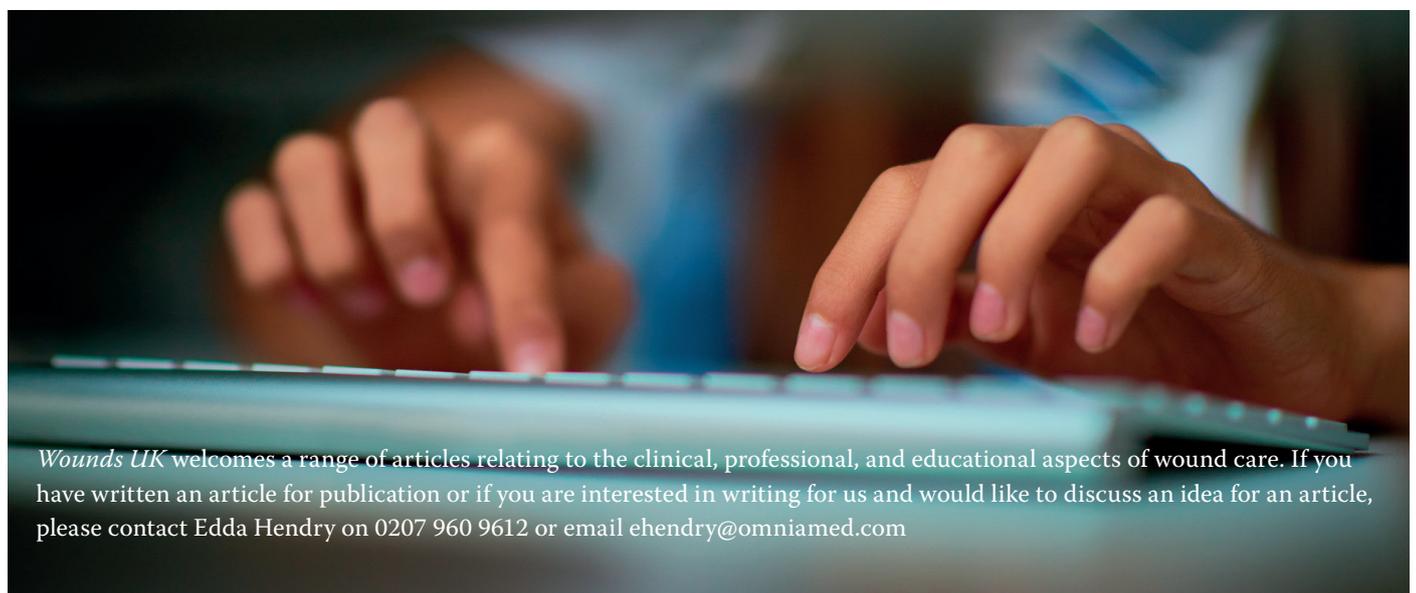
The International Society for Paediatric Wound Care have hosted a total of three conferences that provided a fantastic opportunity to meet with colleagues from around the globe with a specific focus on all aspects of neonatal and paediatric wound management.

LO: A national focus with regards to care for children is justified. We need awareness of wound healing in children with genetic problems but the overall approaches used to support and manage all children are where the focus needs to be. These areas encompass ways in which we can allay children's fears, how we can take away the hurt, how to speak and treat a child, how to support and manage parents/carers when their child has a problem and look at the evidence that supports dressings within paediatric care. In sharing experiences through study days, conferences and distance learning we can translate and adapt the learning from children's nursing to adult nursing and vice versa. Working across adult/children, acute and community services allows us to learn and share experiences across the full spectrum of nursing.

DA: It is justified on the basis of my answer to the previous question. We know pitifully little on paediatric pressure ulcers. I realise this does not exhaust all wounds. **WUK**

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