ORIGINAL ARTICLE

Prevalence and distribution of petechiae in well babies

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Aims: To determine the prevalence of petechial spots in well babies.
Methods: A total of 116 babies under the age of 12 months were fully examined at child health surveillance clinics. The number and site of petechiae were recorded together with details of possible causes.
Results: A total of 27.6% of babies had one or more petechiae, 8.6% had two or more petechiae, and 2.6% had more than two. None of these babies subsequently developed sepsis.
Conclusions: Many well infants examined in the community are likely to have petechial spots. In this setting one or two petechiae are common and their presence should not be taken as pathological without other clinical signs. Recognition of this fact may also be helpful when examining otherwise well infants with petechiae in a secondary care setting.

Many children assessed in accident & emergency and day assessment units have a few petechial spots; only a minority have invasive bacterial disease.[1–5] Currently there is no consensus among paediatricians for the evaluation and treatment of febrile children with petechial rashes.[6] A recent approach has been that further investigation and management should be based on whether or not the child is well or ill, combined with the results of white cell count and C reactive protein.[7] A recent diagnostic algorithm suggested using a combination of characteristics, distribution, and diameter of purpura with clinical condition and nuchal rigidity.[5] Much of this work is based on the observation that petechiae are an important marker of potentially serious disease. In order to determine the specificity of petechiae in any children as a marker for disease, the prevalence of petechiae in the normal population needs to be established. As far as we are aware there are no published data to provide this information. We have chosen to examine babies under a year old as this age group presents the largest diagnostic difficulty and has the highest mortality from meningococcal septicaemia.[8]

Knowledge of the prevalence of petechiae in the normal population may help with the evaluation of infants who have some non-blanching spots but lack other features of meningococcal disease.

PATIENTS AND METHODS

The study was carried out between October 2000 and February 2001 in the Sunderland area. After local ethics committee approval, general practitioners and health visitors gave permission for us to recruit their patients as subjects. The babies were enrolled from well baby clinics based at three general practices and two community based hearing clinics. Written consent was obtained from parents prior to examination and a record of participation was made on the parent held record.

Demographic data were obtained on each subject and parents were asked if they had noticed any spots or marks on the baby's skin. The babies were examined by one of two investigators (AD or DC). A petechial spot has been defined as a red/purple lesion less than 2 mm in diameter that does not blanch under pressure. A proportion of babies was examined independently by both investigators to verify concordance. Petechial spots were recorded on a body chart together with any bruises. The normal distribution of bruises in babies has been established previously.[9]

Table 1 Anatomical site of petechiae

Site of petechiae	Number of babies with any petechiae at this site
Upper limbs	3 (2.5%)
Lower limbs	16 (13.8%)
Trunk	15 (12.9%)
Head and neck	3 (2.5%)

Twenty seven babies had petechiae at one site; five had petechiae at two sites.

Some babies who had petechiae at first examination were re-examined at a later date to see whether they had disappeared.

RESULTS

The parents or guardians of 119 babies were invited to participate in the study. Consent was not obtained from three: two because of time constraints and the other because of the deteriorating patience of the older sibling in the clinic. Health visitors had no concerns about babies or families in whom participation was declined. Therefore a total of 116 babies (65 girls) were examined. The age range was 2–52 weeks with a median of 23 weeks. Eleven babies were examined by both investigators independently at the same session. There was 100% concordance between the examiners in respect to the presence or absence of any petechiae and their position on the child's body.

Thirty two babies (27.6%; 95% CI 19.7% to 36.75%) had one or more petechial spots. Ten babies (8.6%; 95% CI 4.2% to 15.3%) had two or more petechiae, of whom three (2.6%; 95% CI 0.5% to 7.4%) had three or more (fig 1). Of the three that had more than two petechiae, one baby had three spots, another nine, and the third 20. The 20 petechiae on the third baby were found in association with eczema. We split the distribution into four sites as shown in table 1. Twenty seven babies had petechiae at one site, with the remaining five affected at two sites. The sites of petechiae can be divided into the distribution of the superior vena cava and the inferior vena cava—that is, above and below the nipple line. In our study, of the 32 infants with petechiae, nine were affected above the nipple line, 18 below the nipple line, and five both above and below.

Forty subjects were reported by their parents to have suffered a viral illness in the preceding two weeks. Of these,

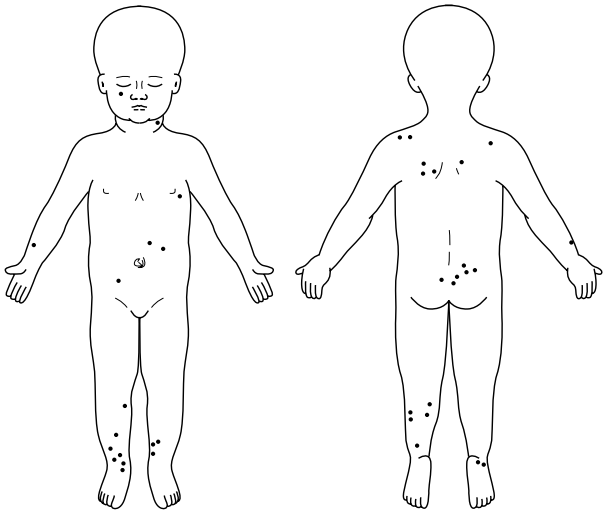

Figure 1 Body map outlining the distribution of petechiae in those babies with one, two, or three spots. Two babies have been excluded. One had eight petechiae in a group on his right shoulder and one on the left temporal region. The other had approximately 20 on the anterior surface of her right thigh and shin and one on the right arm.

22.5% had one or more petechiae compared with 30.3% of those with no viral illness reported. This difference is not significant. Within the power of this study, age, sex, and mobility of the child did not influence the likelihood of finding petechial spots. The carers had noticed the petechiae in four of the 32 babies prior to being examined. Four babies with one or more petechiae were seen approximately two weeks following their initial examination and in all cases the petechiae were no longer present.

None of the babies with petechiae were thought by the examiners to be at all unwell and the carers were reassured. In every case the carers were satisfied that the petechiae were not caused by serious disease. No baby who was admitted to Sunderland Royal Hospital with invasive bacterial disease within the time frame of the study had participated in the study. The health visitors did not report that any of the participants had been admitted to other hospitals.

Four babies (3.4%) were found to have bruises. All these were 32 weeks of age or over and had an adequate explanation available from the carer. This prevalence is less than previously published although our study included younger infants.[9] Two of these also had petechiae.

DISCUSSION

The Meningitis Trust has appropriately increased public awareness of the potential importance of petechial rash. It has been our observation that an increased number of parents present to accident & emergency or to general practitioners, having found a spot on their child that does not blanch with the "glass test". In our study the vast majority of petechiae found on detailed examination had not been noticed by the carers. Presumably this relates to the fact that all our subjects were well and guidelines to carers are to search for non-blanching spots should their child become unwell. New medical and nursing staff in particular are often worried about the significance of petechial spots in otherwise well infants and children. It is clear that sick children with petechiae need to be managed on the assumption that they have meningococcal disease. The apparently well child with petechiae presents more of a management dilemma. Some are of the opinion that as petechiae occur in meningococcal disease, any child with a petechial rash should be managed with intravenous antibiotics pending further results. However, empirical use of antibiotics in babies, who are well, with few petechiae, may increase anxiety, increase admission rates, potentiate cephalosporin resistance, and mask or partially treat other underlying bacterial infections. Others suggest that antibiotics can be withheld if the child is not "ill", does not have laboratory markers suggestive of bacterial infection, and is regularly reviewed.[6 7] Meningococcal and other bacterial sepsis can present without petechiae and treatment of the unwell child without a rash should not be delayed.[10]

We have shown that in well babies petechiae are more likely to be below the nipple line. Others looking at a population of unwell children, presenting to secondary care, have suggested that petechiae above the nipple line are less likely to indicate serious disease.[2 4] Petechiae above the nipple line may have a mechanical cause, such as vomiting or coughing. Although universal distribution is more common, meningococcal disease can present with petechiae at any site, and it is our opinion that the site of the rash alone does help confirm or refute the diagnosis early in the course of the disease.[5]

We have shown that one or two petechiae are common in well babies under 1 year of age and therefore their presence alone is likely to be of little diagnostic value in supporting the clinical suspicion of meningococcal septicaemia. However, in cases with other clinical signs they should be noted in case of progression. More than two petechiae are less common, although do not necessarily indicate serious pathology. Certainly in the three cases that we saw there was no suggestion or development of serious pathology. Trauma, including non-accidental injury, clotting abnormalities, and other bacterial and viral infections may need to be considered.

Most studies looking at the significance of petechiae begin with the pyrexial baby and relate the presence of petechiae to invasive bacterial disease. This is the first study to show the prevalence of petechiae in the normal population.

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