

# Neonatal Lupus Erythematosus

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Neonatal lupus erythematosus is a distinct subset of lupus erythematosus. It is characterized by cutaneous findings exhibiting the morphology of subacute cutaneous lupus erythematosus, congenital heart block, and anti-Ro/SSA and/or anti-La/SSB autoantibodies which result from the transplacental passage of maternal autoantibodies.

We report a case of a 12-week-old female infant who presented with characteristic clinical and histopathological features of cutaneous neonatal lupus erythematosus but without evidence of congenital heart block. Initial serological studies revealed the presence of anti-La/SSB antibodies and antinuclear antibodies. 5 months later, follow-up serology was negative in accordance with a clinical remission. (*Ann Dermatol* 10:(3) 185~189, 1998).

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The syndrome of neonatal lupus erythematosus (NLE) was initially described in 1954 by McCuiston and Schoch<sup>1</sup>. It is a rare syndrome characterized by skin lesions which are analogous to those of subacute cutaneous lupus erythematosus (SCLE) of adults. Babies with this disease typically have non-scarring lesions of SCLE or congenital heart block, or both<sup>2</sup>. Both mother and baby are usually positive for IgG anti-Ro/SSA and/or anti-La/SSB autoantibodies. These autoantibodies pass through the placenta to the baby and may be important in initiating the disease<sup>2</sup>.

We describe herein a case of NLE which has not yet been reported in Korean literature.

## CASE REPORT

A 12-week-old female infant presented with a facial eruption which had begun at 2 weeks of age. The lesions initially developed on her forehead, and later spread to involve the scalp, nose and cheek. She was born following an uncomplicated

full-term pregnancy by normal vaginal delivery.

On physical examination, the patient had annular, erythematous lesions with a raised margin on the scalp, forehead and cheek. The bridge of the nose was also involved, and there was a slightly scaly, erythematous patch with telangiectasias and areas of atrophy over the nose and periorbital areas (Fig. 1A). There was no hepatosplenomegaly, and the remainder of the physical examination was normal.

A skin biopsy specimen showed epidermal atrophy with focal areas of hydropic degeneration of the basal layer. The hair follicle showed only slight keratin plugging. A mild perivascular and periadnexal lymphohistiocytic infiltration was observed in the dermis (Fig. 2).

Serological studies were positive for anti-La/SSB but not anti-Ro/SSA antibodies. The fluorescent ANA test was positive at a titer of 1:160 with a homogeneous pattern. An electrocardiogram (ECG) was normal and the complete blood cell (CBC) count and liver function study results were also within normal limits.

The skin lesions slowly faded over the next 2 months without leaving residual atrophy and hyperpigmentation (Fig. 1B). She received no drugs except for topical steroid ointment during the period of her dermatitis. Anti-La/SSB antibody and ANA studies performed at 8 months of age were nega-

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**Fig. 1.** Annular, erythematous lesions with a raised margin on the forehead, scalp and cheek. The nose and periorbital areas were also involved with a slightly scaly and atrophic erythematous patch at age of 3 months(A). Complete remission without residual sequelae at age of 8 months(B).

The ANA was positive at a titer of 1:80 with a speckled pattern.

## DISCUSSION

NLE is an uncommon autoimmune disease whose major findings are SCLE skin lesions and congenital heart block. About half of the NLE cases exhibit skin disease and about half exhibit congenital heart block. Approximately 10% of cases have both skin disease and heart block<sup>2,3</sup>. NLE is a prototypic autoantibody-mediated disease as the developing fetus and newborn passively acquire maternal autoantibodies. These infants have maternal anti-Ro/SSA, anti-La/SSB and rarely, anti-U<sub>1</sub>RNP autoantibodies which pass through the placenta from mother to child<sup>2,4</sup>.

Cutaneous lesions of NLE are sharply margined, annular or polycyclic, erythematous patches or plaques, with or without atrophy, scaling and telangiectasia<sup>2,5</sup>(Fig. 1A). They are commonly found on the scalp, face and neck, but can also occur on the trunk and limb<sup>3</sup>. The lesions appear at birth or more commonly within a few weeks, and usually resolve without scarring by six months of age<sup>5</sup>(Fig. 1B). NLE therefore provides the

**Fig. 2.** Histopathological examination of the facial lesion shows epidermal atrophy, focal hydrophic degeneration of the basal layer, slight keratin plugging of the hair follicle, and mild perivascular and periadnexal lymphohistiocytic infiltrate of the dermis (H&E stain,  $\times 200$ ).

tive.

The 33-year-old mother has no history of connective tissue disease and remains asymptomatic. She delivered a normal, healthy female infant 6 years earlier and this case was the second child born to her. Serological studies showed the presence of anti-Ro/SSA and anti-La/SSB antibodies.

strongest clinical evidence that autoantibodies are involved in at least some manifestations of lupus erythematosus. It is common for sun exposure to induce or exacerbate lesions, however, sun exposure is almost certainly not required for lesions to occur. NLE skin lesions have been reported to be present at birth, for example, and lesions may occur in the relatively protected areas of the skin<sup>2</sup>.

The histology of lesional skin is consistent with SCLE, with prominent features being basal cell damage in the epidermis and a relatively sparse mononuclear infiltrate in the superficial dermis<sup>6</sup>(Fig. 2). The immunofluorescent findings are consistent with SCLE, namely, a particulate deposit of IgG in the epidermis<sup>7</sup>.

Disease entities that can conceivably be confused with NLE include herpes simplex, other viral infections, infantile eczema, Leiner's disease, intrauterine trauma, and a variety of photosensitivity eruptions. However, the characteristic skin manifestations of NLE, especially annular erythematous lesions of the face are sufficiently distinct to be differentiated clinically from these other diseases.

In addition to the cutaneous NLE lesions, these infants may show systemic disease manifestations. Specifically, hepatosplenomegaly and Coomb's-positive hemolytic anemia have been demonstrated<sup>8</sup>. The systemic features of these children's illness are generally mild, and these infants do not satisfy the American Rheumatism Association's criteria for the diagnosis of systemic lupus erythematosus(SLE). One systemic manifestation of NLE, congenital heart block which begins in utero, however, is potentially fatal. Unlike the cutaneous NLE lesions, because of the fibrosis in the conduction system, heartblock is almost always permanent<sup>9,10</sup>. Despite having an exceptionally slow heart rate, approximately half of babies with heart block due to NLE are well compensated and do not require treatment. The other half need pacemaker implantation<sup>2,11</sup>. About 10% of babies with heart block do not respond even to pacemaker implantation, probably because of coexistent myocardial disease, and die of intractable heart failure<sup>12</sup>.

It has been definitely established that antibodies directed against the cytoplasmic macromolecule termed Ro/SSA and La/SSB are of importance in the evaluation of the condition of patients with cutaneous lupus erythematosus<sup>13,14</sup>. Since Weston et

al<sup>15</sup>. proposed anti-Ro/SSA and anti-La/SSB antibodies as serological markers for the NLE syndrome, subsequent reports<sup>16,17</sup> have confirmed that the anti-Ro/SSA antibodies may be the true serological marker for NLE. It is of interest that a few babies<sup>18,19</sup> with NLE including our case have had only anti-La/SSB autoantibodies detected by immunodiffusion in the apparent absence of the anti-Ro/SSA antibodies. This is because the latter have been known to be less specific as a serological marker than anti-Ro/SSA<sup>20</sup>. In these cases, more sensitive tests have been required to demonstrate anti-Ro/SSA autoantibodies. Because anti-La/SSB autoantibodies rarely, if ever, occur in the absence of anti-Ro/SSA, it can be presumed that a baby who has anti-La/SSB also has anti-Ro/SSA<sup>2</sup>. Both mother and child with NLE generally show a speckled pattern of ANA, thus it is meaningful that our patient and her mother were positive for ANA.

Management of skin lesions of NLE consists of protection from sun exposure and use of non-fluorinated topical steroids. Systemic treatment is not indicated<sup>2</sup>. Treatment of heart disease is not always necessary, as mentioned above. For those children with heart failure due to a slow heart rate, pacemaker implantation is the treatment of choice. Children who have heart failure even after pacemaker implantation and children who have other serious internal manifestations may be treated with systemic steroids<sup>2</sup>.

The outlook for adolescence and adulthood in individuals who had NLE is not known. Babies with NLE who survive the neonatal period usually have reasonably healthy childhoods and adult-hoods. Several reports<sup>21,22</sup> have described patients born with NLE who later develop connective tissue disease in adulthood. However, we have the general feeling that our patient who has skin disease only portends a benign prognosis, because she did not exhibit congenital heart block and has no evidence of connective tissue disease, such as autoantibodies and skin problem, at present.

The mothers of infants with NLE are generally normal, healthy persons. Some of the mothers, however, have developed autoimmune diseases such as SLE and Sjögren's syndrome later in life<sup>23</sup>. The infant's antibodies disappear during the first six months of life. However, the mothers persist in demonstrating the presence of these anti-Ro/SSA

and anti-La/SSB antibodies. Conceivably, the antibody is of maternal origin and the infant's normal catabolism destroys it within the first six months of life. It suggests that transplacental maternal autoantibodies may play a role in the pathogenesis of NLE.

Although the outlook for mothers appears to be generally good, there is a possibility for the development of serious autoimmune disease. Thus close observation is necessary for the mothers of infants with NLE. Mothers who have previously had a baby with NLE have approximately a 25% chance of having another baby with NLE in a subsequent pregnancy<sup>23</sup>. Also, women who have SLE may be at higher risk. In a group of women, screening tests should include fluorescent ANA and testing specifically for anti-Ro/SSA and anti-La/SSB autoantibodies. That the slow heart rate is due to heart block can be confirmed by fetal ultrasound during routine obstetric examination. We also suggest that serologic studies for anti-Ro/SSA and anti-La/SSB antibodies should be performed in a case of annular skin eruptions of infancy.

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