

An Overview of Neuro-Cutaneous Syndrome (NCS) with a Special Reference to Symptomology

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Abstract

A detailed analysis of the clinical history of a random sample of 50 NCS patients (9 males, 41 females) is reported. Symptoms are classified into six categories, neurological, dermatological (including opportunistic skin infections), systemic, oral, allergic and general. The most common symptoms in each of these categories in the same order are pin prick and crawling sensations, skin lesions and sores, respiratory and bowel disturbances, gum disease, sensitivities to light, noise and mold, and fatigue and insomnia. Symptoms were relatively similar in both sexes. These results are tabulated and their biological foundation explained. The misdiagnosis of NCS by medical professionals is discussed. NCS symptoms in toothless patients and those on recreational drugs are described. Over 360 dental toxins are placed in four major categories and their mode of action explained. Incubation period varied between a few hours to 28 years. Our protocol for rehabilitation is included. All patients following and completing our rehabilitation protocol recovered.

Introduction

Neuro-Cutaneous Syndrome (NCS) is a dental toxicity disorder causing various clinical symptoms compatible with those of toxic-allergic reactions in sensitive patients. The neurological and dermatological symptoms were well documented in Amin.¹⁻³ They are here quantified along with others that were not previously reported. Expanded notes on misdiagnoses, special NCS cases, sealants, incubation and recovery are also included.

Materials and Methods

Files of 50 randomly selected NCS patients that have completed a lengthy standard questionnaire were selected for this study. These included 41 females (age 24-63, mean 48 years) and 9 males (age 35-56, mean 46 years), who were personally examined, evaluated and determined to be NCS cases in 2004 and 2005. Information used were substantiated with medical documents, dental histories, photographic records and personal observations and interviews. Patients are routinely followed up to monitor their progress and insure the resolution of their symptoms.

Results and Discussion

1. SYMPTOMS

Symptoms of NCS are classified into six categories, neurological, dermatological, systemic, oral, allergic, and general. The most prominent symptoms in all NCS patients and the earliest in occurrence are the first two. A detailed and systematic analyses of symptoms in all six categories follows. The fifty randomly selected patients included 41 females and 9 males. An allowance for the disproportionate representation of males and females in this sample in the interpretation of results should be made. By far, most NCS patients we see are females. It is not known if females are more commonly allergic to sulfa, zinc or other dental toxic compounds and if hormones are involved.

1-a Neurological symptoms are the most prevalent and most diagnostic of NCS. All NCS patients experience skin irritation manifesting as pinprick or crawling and movement

¹ Amin OM, Neuro-cutaneous Syndrome (NCS); a new disorder. *Explore* 10:55-56, 2001. ² Amin OM, On the diagnosis and management of Neurocutaneous Syndrome, a toxicity disorder from dental sealants. *Calif Dent Assoc J* 32: 657-663, 2004. ³ Amin OM, Dental sealant toxicity: Neurocutaneous syndrome (NCS), a dermatological and neurological disorder. *Hol Dent Assoc J*. 2004;1-10, 2004

sensations; usually both (*Table 1*). These sensations are caused by damage to nerve cells caused by such dental materials as toluene^{2,3} and methacrylates.⁷ Damage to the nervous system also manifest in loss of memory, brain fog, poor concentration and vision problems in many NCS patients. Males appear to be more susceptible to burning sensations and body tremors than females. The pin prick and crawling sensations were most severe (*Table 1*) and are considered the primary diagnostic symptoms of NCS even in absence of all other symptoms.

1-b. Dermatological symptoms represent classical allergic reactions to dental toxins that NCS patients are sensitive to. They generally start as small itchy sores and inflamed elevated pimples (see *figs. 1, 2* in Amin²) then they coalesce into larger painful sores (*fig. 1*) and ultimately become ulcerative and open mucoid (*fig. 2*) attracting a wide assortment of opportunistic infections. Histopathological sections of lesions show superficial and deep perivascular infiltrate of lymphocytes and interstitial deposits of granular mucin material. Eosinophils are usually present within the inflammatory infiltrate and foci of epidermolytic hyperkeratosis are often identified within the epidermis (see *fig. 5* in Amin³).

Lesions, sores or pimples were observed on almost all NCS patients (*Table 2*). They may be microscopic but are usually overt and appear first on the face, nearest to the dental sources of damage. They (lesions and sores) are a normal manifestation of typical allergic reactions to toxic chemicals passing through the skin for elimination. Other organ systems are also affected. Sores appear to also be common on the scalp. Elevated ripples, bumps and peeling skin are also related to allergic reactions. Elevated veins (*fig. 3*), tracks (*fig. 4*) and red hot face (*fig. 5*) are associated with increased circulation presumably in an attempt to fight off and contain the toxins.

The fibers found off the open sores are of two types, textile and non-textile fibers. The textile fibers are of clothing or bedding sources and are often used by arthropod opportunistic infections as nesting material. The non-textile fibers are usually the mycelia of such opportunistic Mycetozoa fungi infections as *Madurella* spp. with the “black specks” being possibly their mycelial masses. The healing of some patients’ sores was observed to be correlated with the exit of remaining fibers from the lesions.⁵ Other fungi and bacterial infections identified from swabs taken from patients’ open sores included Staphylococci, e.g., *Staphylococcus aureus* and *S. haemolytica*; Actinomycetes, e.g., *Streptomyces* spp., yeast, e.g., *Candida albicans*, and Enterobacteriaceae, e.g., *Klebsiella* sp.^{2,4} opportunistic infections with these organisms have been shown to aggravate the cutaneous symptoms of NCS patients.³

Opportunistic infections with springtails from NCS patients sores, especially scalp sores, are not uncommon (*Table 2*). Arthropods are attracted to open sores, especially those infected with micro-organisms, for feeding, moisture and possibly nesting. Facial sores of one NCS patient living in an old musty home in a wooded area in Oklahoma included a tick, an ants, a caterpillar, thrips, oribatid mite, and parts of a wasp, crane fly and other insects.⁴ Other arthropods collected from open facial sores of NCS patients include fleas, beetles, winged flies and midges, and spiders^{2,3}. It should be noted that all kinds of opportunistic infections represent only aggravating but not causal factors of NCS sores.

1-c. Systemic symptoms other than dermatological symptoms (above) involve “storage organs” to which dental toxins circulate primarily via the lymphatic system. These organs include the liver, spleen, pancreas, lungs, kidney, heart and intestines. Most systemic symptoms in NCS patients (*Table 3*) reflect toxic damage to these organs especially the lungs (flu-like symptoms, breathing disturbances, coughing, tight chest). Joint and muscular pains and bowel / intestinal disturbances are not uncommon. The swelling represents a typical edematous reaction to toxic blockage of lymph vessels. It may be unilateral or bilateral in arms or more commonly in the lower extremities (*fig. 6*). The presence, intensity and prevalence of systemic symptoms increase in more chronic cases. The more recent acute cases experience less frequent and lighter systemic symptoms (*Table 3*). It is very important that the patient begins organ system detoxification as they undergo dental rehabilitation for which dental biocompatibility testing must be done. Patients will continue to experience symptoms even after proper dental rehab if toxins are not removed from the storage organs. In the course of recovery, symptoms will get worse before they get better as the toxins start circulating out of the storage organs. Parasites are absolutely not related to NCS; they are neither causes or by products of it despite their occasional recovery in some NCS patients. It is important to remove the label “Delusional parasitosis” from the diagnostic vocabulary of NCS.

1-d. Oral symptoms especially gum disease, occur nearest the damage area and should not be surprising. They are caused by either toxic dental materials or by secondary bacterial infections. The latter may be prompted by tissue erosion, atrophy or inflammation caused by the first.^{2,3} The gray color in gum tissue or teeth is attributed to oxidizing sulfa compounds such as in Dycal, Life or Sealapex. Females appear to have a higher prevalence of thrush around the lips than males (*Table 4*).

² Amin OM, On the diagnosis and management of Neurocutaneous Syndrome, a toxicity disorder from dental sealants. *Calif Dent Assoc J* 32: 657-663,2004. ³ Amin OM, Dental sealant toxicity: Neurocutaneous syndrome (NCS), a dermatological and neurological disorder. *Hol Dent Assoc J*. 2004;1-10, 2004 ⁷ U.S. Environmental Protection Agency. *Health and Environmental Effects Profile for Methyl Methacrylate*. EPA/600/x-85/364. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Cincinnati, OH, 1985. ⁵ Amin OM, On the course of Neurocutaneous Syndrome (NCS) and its pseudo-diagnosis by medical professionals. *Explore* 13: 4-9, 2004. ⁴ Amin OM, Facial cutaneous dermatitis associated with arthropod presence. *Explore* 7: 62-64,1996.

1-e Sensitivities and allergies for metals, sulfa, and zinc (*Table 5*) are observed in NCS patients with dental material including these elements such as Dycal, Life and Sealapex. In those individuals, sensitivity to sulfa is noted upon taking sulfa drugs since childhood, use of skin creams including sulfa, zinc or titanium, or bathing in hot-sulfa springs. More than half the patients were also sensitive to bright light, and loud noise. Sensitivity to humidity is related to sensitivity to mold which grows in humid locations especially in patients with history of opportunistic fungal infections. Penicillin is a fungus to which some NCS patients are also sensitive. Females appear to be more sensitive to metals, sulfa, aspirin, and electro-magnetic fields than males. This may be related to the fact that there are many more female NCS cases than male. Patients that have completely recovered remain sensitive to fungal presence and susceptible to fungal promoting conditions in damp, shaded and moldy places with poor air circulation. It is not known if the factor of “cell memory” is involved in this situation. A few years after one patient totally recovered, she checked in a hotel on the shady side of a small street in Madrid, Spain. Within a couple of days, her NCS symptoms started to return. The symptoms were resolved shortly after she moved to another hotel on the sunny side of the street.

1-f. General symptoms were mostly related to lack of energy and poor immune status. Almost all patients suffer from fatigue. More males experienced nausea and weight loss than females. More than half the patients experienced insomnia, night fever and/or sweats, and psychological trauma (*Table 6*). The reported trauma was partially but also directly related to misdiagnosis by medical professionals (see below).

2. MISDIAGNOSIS

The neurological and dermatological symptoms of NCS are often confused by the lay patient as parasitological infections. This leads health care professionals to diagnose the patient as delusional. Dermatologist, on the other hand, tend to explain away skin sores and lesions as having been caused by arthropods that are never recovered or identified. Faulty diagnoses undermine the patients physical and mental health and quality of life, exasperate their physical trauma, especially when diagnosed with mental disorders and forced to submit to psychological treatment against their will.⁵

The most commonly reported psychological misdiagnoses include anxiety disorder, hypertension, polyneuropathy, crazy, delusionary parasitosis, psychosis and unspecific mental disorder. Patients are often told that they are normal and there is nothing wrong with them or that their sores are not clinically significant or that they are self-inflicted. The condition is occasionally described as atopic dermatitis, toxic ulcerative dermatitis, unspecific dermatitis, perivascular dermatitis,

hyperkeratosis, and lymphocystic dermatitis. Dermatologists often indicate scabies mites as the cause based on appearance of sores that are usually not biopsied or swabbed but treated with Elimite, Ivermectin, Pyrimethrin, Clobetasol, and herbs. No mites were ever recovered or identified.⁵ It is a tragedy. Medical professionals need to become more aware of NCS symptoms to properly tend to their patients well being.

3. TOOTHLESS NCS CASES

A few NCS cases were observed where patients have lost their original teeth but continue to experience NCS symptoms years later. These are usually chronic cases where much of the causative dental toxins have already circulated into storage organs now serving as secondary sources of toxicity and symptoms.

Case no. 1:

ME, a white male from Las Vegas born in 1950. We saw ME at PCI in September, 2005 three years after dental treatments using Unicem, Clear Fill Prime and Bond, Fuji products, Rely x (all methacrylate-based), and Temp Bond (zinc oxide-based), among other products. He started experiencing severe NCS symptoms shortly there after. His symptoms continued unabated even after the removal of the last of his original teeth one year later. He made considerable progress following our protocol until he died few weeks later from an injection of Narcan in a hospital for a minor cardiac condition.

Case no. 2:

JM, a white woman from Kentucky born in 1961. JM used Herculite products (methacrylate-based) in 1991 before all her original teeth were replaced with dentures. She continued to experience severe NCS symptoms through September, 2005 when we saw her at PCI. She is now on systemic detox protocol and is beginning to show improvement.

4. PATIENTS ON DRUGS

Occasionally we see NCS patients experiencing NCS symptoms, especially neurological and dermatological, that are also regular users of recreational drugs. The most commonly incriminated drugs are methamphetamine (crystal meth) and cocaine that apparently affect the nervous system in a manner similar to that caused by dental toxins. Marijuana (weed) was observed to cause skin abnormalities similar to those caused by dental toxins especially in the face of patients who are allergic to pollen; weed is made of flowering plant parts. Recreational drugs, thus, complicate the clinical picture of NCS for diagnostic and rehabilitation purposes, and are consciously accounted for in our diagnosis. Patients are advised that dental rehabilitation and systemic detoxification will not do it unless they lay off drugs.

⁵ Amin OM, On the course of Neurocutaneous Syndrome (NCS) and its pseudo-diagnosis by medical professionals. *Explore* 13: 4-9, 2004.

5. SEALANTS

Sealants (liners, bases) have the primary role in the causation of NCS.^{2,3,6} Other dental materials such as adhesives, cements, etc. are also causative agents of NCS. A preliminary list of names and chemical composition of over 360 dental compounds causing NCS is given by Amin.⁶ These compounds are classified into four categories based on their toxic ingredients: (1) Zinc Oxide, (2) Ethyltoluene sulfonamide (especially in patients allergic to sulfa and toluene), (3) Methacrylate compounds, and (4) Titanium Dioxide and other metal compounds (especially in patients allergic to metals), as well as Calcium Hydroxide.

The toxicities of dental materials in categories 1,2,4 were reported by many scientists from various mammalian systems *in vivo* and *in vitro* and summarized by Amin.^{2,3} Zinc oxide was shown to be genotoxic, cytotoxic, killing macrophages and causing chronic and fibrous inflammatory reactions, ulcerations and osteosclerosis. The toxic effects of zinc oxide and calcium hydroxide were shown to be similar. Calcium hydroxide can cause periapical inflammation, typical granuloma and partial lack of healing. Titanium dioxide and barium ions provoke strong foreign body and bio-incompatible reactions in live tissue. Toluene is a known potent nerve toxin. Sulfonamides bring about the allergic reaction ultimately manifesting as the vascular mucoid sores characteristic of NCS, especially in sulfa sensitive patients. The above compounds in sealants like Dycal, Life and Sealapex cause neurotoxicity, cytotoxicity, severe inflammatory infiltration, edema, tissue necrosis, granulomatous reaction, hemorrhage, karyorrhexis, and formation of serous exudates.^{2,3}

The methacrylate compounds are perhaps the most commonly used dental materials to date. They are also used in the impregnation of concrete to make it water-repellent.⁷ The Environmental Protection Agency (EPA) has documented the impact of methacrylates in humans as early as 1985. The acute effects listed by EPA include neurological changes and depression, irritation to skin and mucous membranes, allergic reaction, liver and lung damage, pulmonary edema and acute toxicity by oral exposure. Chronic effects listed include kidney and liver lesions, cardio-vascular disorders, headaches, fatigue, sleeping disturbances and irritability.⁷ All are common NCS symptoms. Common harmful effects of the many methacrylate-based compounds listed in their MSDS include skin irritant, sensitivity, corrosive, pain, burns, redness, inflammation, harmful in contact with skin, rash, burns, sensitization, etc. The same MSDS refers to the methacrylate resins as hazardous or toxic.

We observed that the toxicity of dental materials is determined by the concentration of toxic ingredients, amount of compounds used and the number of teeth involved. Patients reaction depends on the degree of sensitivity/reactivity to the compounds. These factors determine the length of incubation period. The cumulative levels of toxins would have to break through each individual patient's threshold level of tolerance before the patient begins to experience clinical NCS symptoms.

6. INCUBATION AND RECOVERY

Incubation period (time between first treatment with toxic compounds and first appearance of symptoms) was 1-21 years (mean 6.6) in males and few hours to 28 years (mean 7.2 years) in females.

Case no.3:

LG, a white American female born in 1957. LG experienced the shortest incubation period of a few hours shortly after filling only one tooth (no. 18) using Dycal as a liner in September, 1998. LG has always been allergic to sulfa. She experienced severe headaches within two hours after the procedure and had to leave work. By 6:00 PM that same evening, she was vomiting and delirious with the headache persisting. She was admitted to ER where her blood pressure was monitored at 169/108 and remained high for the following three years despite repeated attempts to control it with Atenolol and Diazide. LG never had high blood pressure before. Her health dramatically deteriorated progressively as she lost considerable weight. Arthritis-like symptoms in her back, heart palpitations, mitral valve prolapse, fatigue, night sweats, and severe depression. Lesions started appearing on her face which then became swollen and painfully burning (*fig. 6*). Open lesions erythema, tracks and grayish pustular oozing secretions attracted springtails and fibers. She tested negative for all communicable diseases at the time. We diagnosed LG with NCS in January, 2002. Following our protocol, all NCS symptoms were resolved by May 2002. Constitutional and neurological functions as well as psychological, emotional and energy levels have also been restored to normalcy. This case demonstrates that, sometimes all it takes is one problematic tooth to cause NCS in a sensitive patient.

Case no. 4:

BS, A white American male from Provo, Utah born in 1970. By contrast BS was one of the patients treated with a very large number of dental materials. Ten dental compounds were used in 12 teeth between July, 1995 and January, 2005 were Guta Percha (on 5 separate occasions), Temp Bond (10 occasions), Fugii I (10 occasions),

² Amin OM, On the diagnosis and management of Neurocutaneous Syndrome, a toxicity disorder from dental sealants. *Calif Dent Assoc J* 32: 657-663,2004. ³ Amin OM, Dental sealant toxicity: Neurocutaneous syndrome (NCS), a dermatological and neurological disorder. *Hol Dent Assoc J*. 2004;1-10, 2004 ⁶ Amin OM, Dental products causing Neuro-cutaneous Syndrome (NCS) symptoms in NCS patients. *Explore* 14: 57-64, 2005 ⁷ U.S. Environmental Protection Agency. *Health and Environmental Effects Profile for Methyl Methacrylate*. EPA/600/x-85/364. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Cincinnati, OH, 1985.

Clear Fil (2 occasions), Durelon (1 occasion), Sealapex (4 Occasions), Pro Bond (3 occasions), Tetric Flowable composite (1 occasion), Filtek (1 occasion), Herculite (2 occasions). His blood bio-compatibility test demonstrated hyper-reactivity to Temp Bond, Fugli, Durelon (first used in 1995-96) and Pro Bond (first used in 2000).

BS started experiencing NCS symptoms in 2003 after an 8 year incubation period. Moderate to severe symptoms included itchy pimples, tracks, all neurological symptoms (*Table 1*), high blood pressure, intestinal and breathing abnormalities, severe liver dysfunction, arthritic and muscular pain, all oral abnormalities (*Table 5*), and all general symptoms (*Table 6*). BS was also allergic to penicillin, mold, milk, and electro-magnetic fields. A skin culture in August, 2005 showed infection with *Staphylococcus aureus* and *Candida* sp. We diagnosed BS with NCS on August, 4 2005 when we set him on a 5-track rehabilitation protocol. He responded beautifully early on especially to Ubichinon compositum, a Heel Co. homeopathic systemic detoxification product with a specific action against toxin buildup, fatigue and weakened constitution, even before his dental rehabilitation started in November, 2005. His recovery is underway.

We have records of two 46 and 47 year old white American females (DO from Arizona and CD from California) with 39 and 35 year long incubation periods, respectively. They both experienced classical and mostly severe NCS symptoms in all categories. Their clinical history was, however, not fully documented and will thus not be featured here. The next longest documented incubation period of 28 years was noted in case no. 5 below.

Case no. 5:

PO, a white female from British Columbia, Canada born in 1961. PO's first dental work was performed in 1973-1974 followed shortly by more totaling 13 teeth by the late 1970's. Dental and gum problems forced the extraction of all teeth in the upper jaw. She came to see us in April, 2004 when she was diagnosed with NCS. By that time, only eight teeth on the lower jaw remained. These included four crowns and two fillings in two other teeth. Her dental experience since the early 1970 include the use of Dycal, Cavitec, Filtek, Pulp Canal Sealer, Temp-Bond, Fynal, Sultan, Identity, Dentsply trubyte, and other temporary and impression materials. PO's bio-compatibility test showed high reactivity to Dycal, Life, Cavitec, among others. She started experiencing severe NCS symptoms in 2003. She had open lesions and sores on her face and scalp, all neurological sensations (*Table 1*), flu-like symptoms, bowel disturbances, vomiting and abscesses. She was allergic to sounds, light, humidity and metals. She was always fatigued with nausea, insomnia and psychological trauma, and lost considerable weight. She had her dental rehabilitation done by June, 2004 and is currently improving following our protocol.

Conclusions

This is the first comprehensive study of the symptomatology of NCS. Other aspects of the syndrome are also treated here for the first time. The toxicity of many dental products is well established by now. The awareness of some practitioners of the serious health impact of routinely used compounds need to be enhanced. NCS is a treatable and manageable syndrome. The degree of patients reactivity to the many potentially toxic dental compounds need to be researched before, at least major, dental procedures are performed.

Management of NCS involves a 5-track approach. (1) Dental rehabilitation including the removal of old fillings, crowns, etc. and replacing with bio-compatible material. This is usually done first. No more than two or three teeth can be done per month otherwise the patient may go into chemical shock as dental toxins begin being stirred up and circulating in the body especially if systemic detoxification begins at the same time, which we recommend. This is the reason why symptoms will always get worse initially before they get better. A patient with 21 teeth to be rehabilitated will take at least seven months to finish the dental work alone. We recommend the remaining four- tracks to be started about the same time and to continue for a short time after the dental work is completed. (2) Vitamins and supplements and (3) additional natural products are given to boost the immune system and improve natural strength and resistance against toxins and skin infections. (4) Systemic detoxification and (5) Lymph drainage massage to break down and circulate toxins out of storage organs to lymph nodes for final elimination. The homeopathic detox agent are given for the duration but the frequency of the lymph drainage massage can be reduced from twice weekly to once / week, then once / 2 weeks and so on until all the symptoms are resolved.

All patients following and completing this protocol invariably experienced complete recovery making for 100% recovery rate. We insist, however, in examining NCS patients personally at the initial stages to give a definitive diagnosis, do the necessary testing which also include swabbing the skin for opportunistic infections, and instituting a treatment protocol. We follow up with patient and dentist to insure being on track and to fine tune when needed. Patients whose symptoms have completely resolved remain sensitive to moldy and humid environment and fungus, and may experience what appears to be return of some symptoms. In this case patients are advised to remove themselves out of that environment instantly.

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Fig. 1 – Inflamed sores in the face of EJ, a female from Norway born in 1971, treated 7 teeth with Dycal, Life, Clearfil SE Primer and Bond in 1979, and with Procosol (one root canal) in 1995; highly reactive to Dycal and Life (bio-compatibility test); first experienced NCS symptoms in 1989; diagnosed with NCS at PCI in April, 2004 followed our protocol, symptoms completely resolved by January, 2005.



Fig. 2 – Fulminating mucoid lesions in the face of MM in 1982 a female from California born in 1950; treated with Fynal in six teeth in 1981 and in another tooth in 1986, and with Life in two teeth in 1985 and 1988; highly reactive to Dycal and Life (bio-compatibility test); diagnosed with NCS at PCI in 1999; did our protocol in May and June, 2004; gradual improvement as of August, 2004.



Fig. 4 – Tracks in the arm of JM; same patient in Fig.3.



Fig. 3 – Elevated veins in the hands of JM in 2001, a female from Arizona/Colorado born in 1965; treated with Dycal in 16 teeth; first NCS symptoms in 1991; diagnosed with NCS at PCI in 2000; Dycal was removed in 2001; complete resolution of symptoms in 2002.



Fig. 5 – Red hot face and sores in the face of ME, a Swedish female born in 1951; treated with Dycal in 20 teeth in 1985; first experienced NCS symptoms shortly thereafter; allergic to sulfa; Dycal was removed in 1991 and 1992; experienced painful recovery for one year before total resolution of symptoms was achieved.



Fig.6 – Swelling in the right leg of LG (see case no. 3).

Table #1
Neurological Symptoms in 50 NCS Patients

	Patients with symptoms (%)					
			<i>Intensity of symptoms in all 50 patients</i>			
	Males (n=9)	Females (n=41)	Total (n=50)	Severe	Moderate	Light
Skin irritation	9 (100)	33 (80)	42 (84)	35 (83)	7 (17)	0
Pin prick sensations	9 (100)	38 (92)	47 (94)	34 (72)	12 (26)	1 (2)
Crawling sensations	8 (88)	38 (93)	46 (92)	32 (69)	13 (28)	1 (2)
Burning sensations	8 (88)	28 (68)	36 (72)	21 (58)	12 (33)	3 (8)
Movement sensations	9 (100)	39 (95)	48 (96)	27 (56)	15 (31)	6 (13)
Loss of memory	8 (88)	35 (85)	43 (86)	21 (49)	18 (42)	4 (9)
Brain fog	8 (88)	33 (80)	41 (82)	26 (63)	13 (32)	2 (5)
Poor concentration	9 (100)	39 (95)	48 (96)	29 (60)	14 (29)	5 (10)
Body tremors	7 (77)	22 (54)	29 (58)	9 (31)	10 (34)	10 (34)
Vision problems	7 (77)	33 (80)	40 (80)	17 (43)	18 (45)	5 (13)

Table #2
Dermatological Symptoms in 50 NCS Patients

Symptom	Patients with symptoms (%)					
			<i>Intensity of symptoms in all 50 patients</i>			
	Males (n=9)	Females (n=41)	Total (n=50)	Severe	Moderate	Light
Open lesions	8 (89)	37 (90)	45 (90)	22 (49)	14 (31)	9 (20)
Oozing lesions	7 (78)	30 (73)	37 (74)	15 (41)	16 (43)	6 (16)
Painful sores	9 (100)	29 (71)	38 (76)	22 (58)	13 (34)	3 (8)
Itchy pimples	8 (89)	29 (71)	37 (74)	18 (49)	14 (38)	5 (14)
Red hot face	7 (78)	29 (71)	36 (72)	11 (30)	16 (44)	9 (25)
Elevated ripples	6 (75)	27 (65)	33 (66)	15 (54)	18 (24)	7 (21)
Elevated veins	5 (56)	28 (68)	33 (66)	15 (45)	11 (33)	7 (21)
Tracks	7 (78)	26 (63)	33 (66)	16 (48)	13 (36)	5 (15)
Bumps	9 (100)	31 (76)	40 (80)	15 (38)	24 (60)	1 (3)
Skin peeling	8 (89)	29 (71)	37 (74)	13 (35)	12 (32)	12 (32)
Scalp sores	6 (75)	27 (65)	33 (66)	13 (40)	12 (36)	8 (24)
Fibers	8 (89)	29 (71)	37 (74)	21 (57)	10 (27)	6 (16)
Springtails	3 (33)	17 (41)	20 (40)	11 (55)	7 (35)	2 (10)
Fungus	2 (22)	15 (37)	17 (34)	13 (76)	2 (12)	2 (12)
Other skin infections	1 (11)	10 (24)	11 (22)	6 (54)	3 (27)	2 (18)

Table #3
Other Systemic Symptoms in 50 NCS Patients

Symptom	Patients with symptoms (%)					
			Intensity of symptoms in all 50 patients			
	Males (n=9)	Females (n=41)	Total (n=50)	Severe	Moderate	Light
Endocarditis	0	4 (10)	4 (8)	3 (75)	1 (25)	0
Heart palpitations	4 (44)	23 (56)	27 (54)	8 (30)	9 (33)	10 (37)
High blood pressure	5 (56)	12 (29)	17 (34)	5 (29)	6 (35)	6 (35)
Flu-like symptoms	8 (89)	25 (60)	33 (66)	14 (42)	12 (36)	7 (21)
Intestinal abnormalities	5 (56)	26 (63)	31 (62)	14 (45)	11 (35)	6 (19)
Bowel disturbances	7 (78)	28 (68)	35 (70)	17 (49)	13 (37)	5 (14)
Parasites	4 (44)	21 (51)	25 (50)	20 (80)	3 (12)	2 (8)
Vomiting	1 (11)	16 (39)	17 (34)	6 (35)	5 (29)	6 (35)
Kidney problems	2 (22)	14 (34)	16 (32)	4 (25)	8 (50)	4 (25)
Breathing disturbances	6 (67)	27 (66)	33 (66)	10 (30)	13 (39)	10 (30)
Coughing	2 (22)	20 (49)	22 (44)	3 (14)	11 (50)	8 (36)
Tight chest	5 (56)	19 (46)	24 (48)	6 (25)	13 (54)	5 (21)
Swelling	6 (67)	28 (68)	34 (68)	16 (47)	13 (38)	5 (15)
Joint pain	8 (89)	29 (71)	37 (74)	20 (54)	12 (32)	5 (14)
Muscular pain	6 (67)	29 (71)	35 (70)	19 (54)	14 (40)	2 (6)
Liver dysfunction	1 (11)	4 (10)	5 (10)	3 (60)	2 (40)	0
Arthritic symptoms	5 (56)	25 (61)	30 (60)	19 (63)	9 (30)	2 (7)

Table #4
Oral Symptoms in 50 NCS Patients

Symptom	Patients with symptoms (%)					
			Intensity of symptoms in all 50 patients			
	Males (n=9)	Females (n=41)	Total (n=50)	Severe	Moderate	Light
Inflamed gum disease	5 (56)	21 (51)	26 (52)	12 (46)	8 (31)	6 (23)
Gum tissue gray	2 (22)	13 (32)	15 (30)	5 (33)	9 (60)	1 (7)
Mucoid secretions	3 (33)	14 (34)	17 (34)	7 (41)	7 (41)	3 (18)
Dental decay	4 (44)	17 (41)	21 (42)	10 (48)	8 (38)	3 (14)
Abscesses	3 (33)	10 (24)	13 (26)	5 (38)	4 (31)	4 (31)
Teeth gray	3 (33)	8 (20)	11 (22)	1 (9)	6 (55)	4 (36)
Roots painful	2 (22)	13 (32)	15 (30)	5 (33)	6 (40)	4 (27)
Thrush around lips	1 (11)	17 (41)	18 (36)	8 (44)	7 (39)	3 (17)

Table #5
Sensitivities and Allergies in 50 NCS Patients

Symptom	Patients with symptoms (%)					
			Intensity of symptoms in all 50 patients			
	Males (n=9)	Females (n=41)	Total (n=50)	Severe	Moderate	Light
Metals	0	15 (37)	15 (30)	9 (60)	6 (40)	0
Sulfa	1 (11)	7 (17)	8 (16)	6 (75)	2 (25)	0
Zinc	1 (11)	2 (5)	3 (6)	2 (67)	1 (33)	0
Asprin	0	5 (12)	5 (10)	2 (40)	1 (20)	2 (40)
Penicillin	2 (22)	8 (20)	10 (20)	7 (70)	2 (20)	1 (10)
Bright light	5 (56)	22 (54)	27 (54)	11 (41)	12 (44)	4 (15)
Loud noise	5 (56)	24 (59)	29 (58)	9 (31)	15 (52)	5 (17)
Electro-magnetic field	1 (11)	8 (20)	9 (18)	3 (33)	5 (56)	1 (11)
Mold	4 (44)	16 (39)	20 (40)	15 (75)	4 (20)	1 (5)
Humidity	5 (56)	17 (41)	22 (44)	10 (45)	6 (27)	6 (27)

Table #6
General Symptoms in 50 NCS Patients

Symptom	Patients with symptoms (%)					
			Intensity of symptoms in all 50 patients			
	Males (n=9)	Females (n=41)	Total (n=50)	Severe	Moderate	Light
Fatigue	9 (100)	37 (90)	46 (92)	37 (80)	7 (15)	2 (4)
Nausea	8 (89)	22 (54)	30 (60)	10 (33)	12 (40)	8 (26)
Insomnia	7 (78)	30 (73)	37 (74)	27 (73)	6 (16)	4 (11)
Compromised immunity	4 (44)	20 (49)	24 (48)	18 (75)	5 (21)	1 (4)
Psychological trauma	5 (56)	25 (61)	30 (60)	23 (77)	6 (20)	1 (3)
Night fever/sweats	5 (56)	28 (68)	33 (66)	18 (55)	9 (27)	6 (18)
Weight loss	7 (78)	24 (59)	31 (62)	14 (45)	11 (35)	6 (19)

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