Discover
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Fire in the Flesh.(toxic epidermal necrolysis)

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Mary Grove was suddenly shedding skin in large red patches. The loss was a threat to her life.

My Friend Bill Cook, a primary care physician, called me one morning. "I've admitted a patient, a 28-year-old woman," he said. "She's losing her skin. Can you come and take a look at her?" He explained that the patient, Mary Grove, had come to his office the day before, complaining that her skin had suddenly begun to peel. She felt strange--weak and tender--and her eyes and mouth felt irritated. I am a dermatologist, and from Bill's description I had a good idea of what was wrong with Mary.

Before going in to see her, I reviewed her chart. Mary worked as a receptionist and had a husband and two small children. She had felt fine until the day she was hospitalized. The hospital staff performed routine tests, including a chest X-ray and blood tests. They also put Mary on intravenous fluid replacement therapy and pain medications.

I found Mary in her bed, staring at the flickering images on the TV. When I introduced myself she smiled and said, "Hey."

"I'd like to take a look at your skin," I said, "if that's okay."

"What's left of it," she offered.

With the help of a nurse, I began the exam. We both donned gloves and the nurse gently pulled back the bedsheets. I tried to remain expressionless. Mary was looking right at me, and I didn't want to panic her. Her skin was a blanket of red. The top layer was sloughing off her face, neck, trunk, legs, and feet in large sheets like wet wallpaper. Scattered over her body were a few islands of normal-looking skin. I had seen two other patients with this disorder, but neither of this severity.

To determine the extent of the damage, I took a look at the mucous membranes of her mouth, genitals, and eyes.

"Whaddaya think, Doctor?" she slurred. Apparently, she was groggy from her pain medications.

"It appears that you've had a fairly severe reaction to a medicine you took," I said. "It doesn't happen very often, but when it does, it can be a real challenge to care for. But we're going to make sure you get the care you need to recover. It will take some time, but we'll try to make you as comfortable as possible."

"Do you know what happened to me?"

"I have a pretty good idea. But can you answer a few questions first? Have you taken any medicines in the last few weeks?"

"I take something for my knees. It's like a pain pill, but it never gave me a problem before."

"Anything else?"

She paused, her eyes focusing somewhere on the ground. "I did have an earache, and I took something I found in my cabinet. I'd have to check it. I remember one of the kids or somebody used it when they had an infection and it helped, so I took it for a few days."

"How long ago did you take it?" I asked.

"I think it was about two weeks ago," she said.

"And this just started a day or two ago?" I asked.

"Day before yesterday, yeah, I started losing my skin. Felt hot all over and sick to my stomach. First I just had the rash on my face, arms, and legs, and then it was all over, even my lips and my eyes. I got these blisters like I was in one of those horror movies after a nuclear explosion."

"Can you have the medicine brought here?" I asked.

"Sure," she said.

"Are you in much pain?" I asked.

"Not really. I feel kind of stoned," she said. "But I'm trying to take in everything you're telling me."

"The pain medications can make you feel quite fired," I said.

Do you remember the last time you had a minor burn? Do you remember how a small part of your skin peeled off?. The same reaction extended all across Mary's body. Imagine her the day before her, skin erupted: brushing her hair, putting on her makeup, touching herself with a dab of perfume, rubbing moisturizer on her supple, fully intact skin. Put yourself in her busy life, working and taking care of her family. Now here she was, immobilized, her skin peeling off, in the company of hospital monitors and buzzers. But Mary's injury hadn't been caused by anything external, like a burn. The mutiny arose from within.

I explained to Mary that she was probably suffering an extreme and unusual allergic reaction to one of the drugs she had taken. Her immune system, for unknown reasons, viewed it as an enemy and initiated a defense against it. The reaction--called toxic epidermal necrolysis, or TEN--is poorly understood, but the devastation of the skin resembles burn injuries.

"We need to watch you very carefully over the next several days to make sure you don't get an infection or lose too much of your vital fluids," I explained. "The skin acts as a barrier to

bacteria; therefore we have to take every precaution to protect you until your skin returns in full. And we'll need to make sure you get enough fluids. The skin is like a regulator to help make sure the right amount of fluid stays in and the correct amount goes out. Without skin, you lose the principal way your body maintains fluid balance."

I paused, giving her time to absorb my little speech. "It looks as though you've lost most of your skin surface, and it will take some time to build a new one. You need the IV fluids so you don't become dehydrated. And we have to be very careful about infection. Please be patient and hang in."

"Okay, Doctor," she said.

"I'll need to send a small sample of your skin to the pathologist. It will help in confirming your diagnosis."

"Whatever. It's okay," Mary said. "I probably won't feel it too much."

Mary was right; she showed very little discomfort as I anesthetized the irritated skin and used a tiny punch tool to extract a sample from her left thigh. I put it into the biopsy bottle and sent it off to the pathologist for analysis.

I explained to Mary's nurse the care she would need, then called Bill Cook to put together a treatment plan. We would stabilize her in the internal medicine unit of our hospital and then closely monitor her condition.

On the second day of her hospitalization, I got back the pathologist's report, which confirmed my diagnosis. On the third day of hospitalization, we moved Mary to the burn unit, where the staff is trained to care for patients with severe skin loss. They carefully removed the dead skin and applied a loose gauze dressing saturated with antibacterial agents to the denuded skin surface. The staff made sure she was getting enough fluids and nutrients and carefully monitored her fluid intake and urine output. They also kept a close watch on her general condition and vital signs--pulse, respiration, temperature. They monitored her blood for signs of infection or irregularities relating to fluid loss. And each half hour they checked the blood pressure near her heart, which would reveal the first signs of fluid imbalance.

I also called in an ophthalmologist to check Mary's eyes. She had complained that they were dry, and eye damage is common among TEN patients.

Mary was one of about 500 cases of toxic epidermal necrolysis in the United States each year. Although the disorder is considered rare, its frequency may be underestimated because mild cases probably go unreported. Most reported cases, like Mary's, pop up one to three weeks after a new drug is taken. The onset is rapid and in some cases can be terribly severe. Patients can lose their entire epidermis--the uppermost of the skin's three layers--within about 24 hours.

The greatest threat to patients with toxic epidermal necrolysis is not the damage to the skin itself but the manner in which that damage increases a patient's vulnerability to infection. When the epidermis is destroyed, the body surface is a standing invitation to pathogens. Destroyed skin tissue is an excellent environment for bacteria, and within a very short time bacteria contaminating the injury begin to multiply. If left untreated, the infection can spread with disastrous consequences. Roughly 30 percent of patients diagnosed with TEN die--most often because infection has spread into their bloodstreams.

The usual treatment is a topical antimicrobial agent. But first the dead skin must be carefully removed and the area cleansed to speed recovery. Then the denuded area is covered with antimicrobial ointment and a sterile dressing. Applying ice or cold water can help reduce pain and decrease injury. A tetanus shot is also given; this is standard in patients with open wounds who, like Mary, have no recent record of immunization.

The inflammatory reaction is not limited to the skin. The mucous membranes of the eyes, mouth, genitals, and anus often show redness and widespread tissue destruction. Patients can shed the epidermis of the eyelids, as well as eyebrows, fingernails, and toenails. In severe cases the inflammation can extend to the internal organs, causing damage to the intestinal and respiratory tracts. Mary was, in this respect, fortunate. Her internal symptoms were limited to some inflammation in her mouth. A topical ointment helped heal and anesthetize the tender inflamed sites.

Most patients suffer damage only in the epidermis. Blood vessels in the dermis--the layer of skin beneath the epidermis--may swell but remain intact. Within a month, the skin heals, although some residual redness may linger for a few weeks. In some extremely severe cases the damage may extend past the dermis to the subcutaneous layer of skin. When patients suffer this much destruction-which is as severe as a third--degree burn--they need skin grafts.

The prognosis for TEN depends on how quickly the disorder is diagnosed and treated. The peak of the disease (by the third day, in Mary's case) bears the highest threat, and the fate of the patient often hangs in the balance for one or more weeks. Nearly half of the surviving patients have residual and potentially disabling eye lesions, which can include scarring of the cornea. Mary's chances for recovery were good, given that we identified and treated the disorder quickly.

What brings about this terrible eruption? The underlying cause is probably an overactive immune response. But until we understand what sparks the deranged immune reaction, there is no way to prevent it. Fortunately, our methods for treating the injury and preventing devastating infection have improved over the past few years.

What we do know about TEN is that drugs are the most common culprit. But most cases involve patients on several drugs, so it can be difficult to pinpoint the offending medication.

Mary, unlike most TEN patients, had taken only one new drug--a medication for ear pain containing sulfa, which probably ignited the eruption.

After a week in the hospital Mary improved, and within a month she was up and around. Her eyes appeared to have been spared any chronic harm. When I saw Mary just before she was discharged from the hospital, I gave her a list of medicines containing sulfa that she had to avoid. She was in no way, I emphasized, immune to a recurrence. In fact, she continues to be at high risk for TEN if she ever takes products containing sulfa.

I saw Mary for a follow-up visit about a month later. She had fared well. Most of her skin had healed nicely. She said her eye doctor thought her right cornea was a little damaged, but her eyesight had not been harmed. Amazingly, Mary had emerged more or less unscathed. She bore only a slight visible trace of the vast tissue destruction: a small spot of scar tissue on her left thigh.
