

Disorders coexisting in people with Irlen syndrome and the special support they need

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Abstract: Many People with Irlen syndrome complain about not only visual hypersensitivities but also other sensory hypersensitivities. They may coexist with other disorders. Especially when autism is present, sensory hypersensitivity increases. In this study, 34 out of 100 patients with Irlen syndrome who did not have other disorders, 33 had ASD, 6 had ADHD, 8 had LD, 7 had ASD and ADHD, 2 had ASD and LD, 3 had ADHD and LD, and 2 had ASD, ADHD and LD. The male-female ratio of Irlen syndrome was male:female = 53:47. However, when ASD coexists (including multiple coexistence of ADHD and LD), the ratio of male:female = 27:17 is higher for males, and when there is no disability, male: female = 14:25 and female ratio became higher. We conducted a checklist on hyper-sensitivity and insensibility in the checklist of Takahashi and Masubuchi (2008), and investigated what kind of support people with Irlen syndrome need. The results showed that many of them also needed more than just visual assistance. In addition, there were some items whose check rates differed when other disorders coexisted and when they were not. Those who coexisted with ASD generally needed more support, especially items related to skin irritation, clothing, stimming and hyperaia. While, those who had only Irlen syndrome had a remarkable need for support for light sensitivity, and often needed support for taste and smell. Also, those who coexist with ASD may prefer light stimulation (glitter), while those who have only Irlen syndrome tend to dislike.

Keywords: Irlen syndrome, Autism spectrum disorder, Hyperesthesia

INTRODUCTION

Many people with Irlen syndrome have light sensitivity and difficulty reading. Their symptoms are that letters are difficult to read due to strong light or reflection of light, letters appear to be shining, lighting is excessively dazzling, and dark spaces are more comfortable. However, not only vision but also other hypersensitivity may be present. According to Ogata et al. (2016), there is a considerable correlation between vision and hearing, proprioception, tactile sensation, and vestibular sensation, and the bias of the sensation. Many people have difficulty in various situations in society. And some clients who come to counsel coexist with autism spectrum disorders and other developmental or mental disorders. In this study, we examined the disorders that they commonly co-exist and the support they need, including non-visual hypersensitivity.

METHOD

1. The subjects were 100 clients who visited the University of Tsukuba Psychology and Developmental Education Counseling Office for complaining of visual hypersensitivity. They were diagnosed with Irlen syndrome based on the Irlen Reading Perceptual Scale and made color lenses. The questionnaire used is part of the "hyper-sensitivity and insensibility checklist" (Takahashi and Masubuchi, 2008).

2. We collected the following 151 items. "Understanding and support for oral activities" 20 items, "Understanding and support for vestibular sensation and proprioception" 24 items, "Understanding and support for tactile sensation" 36 items, "Understanding and support for vision" 24 items, "Understanding and support for hearing" 20 items, "Understanding and support for olfaction" 7 items, "Understanding and support for eating" 8 items, and 12 items of "Other".
3. Ethical considerations : Clients are identified by their numbers, so no individual can be identified.

FINDING AND DISCUSSION

34 out of 100 patients with Irlen syndrome who did not have other disorders, 33 had ASD, 6 had ADHD, 8 had LD, 7 had ASD and ADHD, 2 had ASD and LD, 3 had ADHD and LD, and 2 had ASD, ADHD and LD. (Figure 1) The male-female ratio of Irlen syndrome was male: female = 53: 47. However, when ASD coexists (including multiple coexistence of ADHD and LD), the ratio of male: female = 27: 17 is higher for males, and when there is no disability, male: female = 14: 25 and female ratio Became higher.

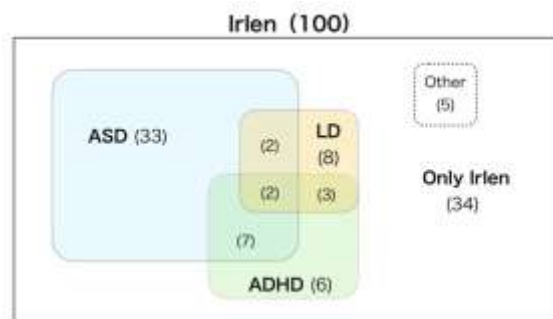


Figure 1. Breakdown by disability

Each item was totaled with "Yes" being 1 and "No" being 0, and the check rate was calculated for each group. In "Understanding and support for oral ", those who coexist with ASD (hereinafter called "With ASD") and those who only have Irlen syndrome (hereinafter called "Only Irlen") tended to calm down after eating coffee, tea, cocoa or sweets. However, 15.91% of With ASD prefer carbonated drinks, while only 2.91% of Only Irlen. Conversely, Only Irlen preferred sour food. It turns out that there is some support they need very much and some they don't. (Table 1)

Table 1. Check rate for "Understanding and supporting oral activities"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
			34	%	44	%
1	Licking the candy will make you calm down, so let me do it	11	3	8.82%	5	11.36%
2	When I chew the gum, I am very calm	15	2	5.88%	9	20.45%
3	I want to bite and lick the ice as it calms down	15	2	5.88%	6	13.64%
4	Drinking coffee or tea is very calming, so let me do it	29	6	17.65%	16	36.36%
5	Drinking warm cocoa or milk can be very calming, so let me do it	27	6	17.65%	14	31.82%
6	Drinking carbonated drinks is very calming, so let me do it	12	1	2.94%	7	15.91%
7	Eat sweet treats and calm down	22	4	11.76%	13	29.55%
8	Eating sour pickles is very calming, so let me do that	8	4	11.76%	2	4.55%
9	I calm down when I lick the inside of the cheek with my tongue	8	2	5.88%	4	9.09%
10	I calm down when I suck, lick or chew inside my lips and cheeks	25	6	17.65%	15	34.09%

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
i		100	34	%	44	%
11	I want to bite a pencil or pen to calm down	13	5	14.71%	8	18.18%
12	I want to chew a stick that mixes coffee to calm down	4	1	2.94%	1	2.27%
13	I want to bite a straw to calm down	14	5	14.71%	5	11.36%
14	I want to bite my fingernail or cuticle to calm down	21	4	11.76%	13	29.55%
15	I want to bite buttons, sweatshirts, collars, etc. to calm down	7	3	8.82%	4	9.09%
16	I want to bite my hair to calm down	0	0	0.00%	0	0.00%
17	I want to smoke a cigarette to calm down	2	0	0.00%	2	4.55%
18	When I whistle while working, I calm down. Don't worry about it	2	0	0.00%	1	2.27%
19	I calm down slowly and deeply	27	6	17.65%	17	38.64%
20	I calm down when I grind the rough thing with my back teeth	1	0	0.00%	0	0.00%
21	I calm down when I squeeze my teeth. Don't worry about that	4	0	0.00%	4	9.09%

Table 2. Check rate for "Understanding and support for vestibular sensation and proprioception"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
ii		100	34	%	44	%
1	I calm down when I jump off from a high place	13	2	5.88%	9	20.45%
2	I settle when I swing the swing high	15	2	5.88%	12	27.27%
3	I want you to be calm when I shake in a rocking chair, so don't worry about that	10	0	0.00%	9	20.45%
4	I calm down when I move on the chair. Don't worry about that	29	8	23.53%	14	31.82%
5	I calm down with my chair half-back down and sitting down. Don't worry about that	20	2	5.88%	12	27.27%
6	I sit down on my chair and shake my legs and calm down. Don't worry about that	26	5	14.71%	14	31.82%
7	I'm very calm when I'm sitting in seiza style	15	3	8.82%	9	20.45%
8	When I cross my legs, I feel very calm	24	5	14.71%	12	27.27%
9	I calm down when I stretch or shake my body	30	8	23.53%	15	34.09%
10	I calm down my neck slowly	15	2	5.88%	9	20.45%
11	Don't worry if my blinks increase	17	2	5.88%	12	27.27%
12	Don't worry if I suddenly clap my hands	9	1	2.94%	7	15.91%
13	I calm down when I shake my body slightly. Don't worry about that	27	5	14.71%	18	40.91%
14	I calm down when I weigh one leg at a time. Don't worry about it	19	3	8.82%	14	31.82%
15	I calm down when I play around. Don't worry about that	6	2	5.88%	3	6.82%
16	I calm down when I step on my toes, heels and feet. Don't worry about that	9	0	0.00%	7	15.91%
17	I calm down when I walk on my toes. Don't worry about that	8	2	5.88%	6	13.64%
18	I feel calm and stable when jogging	9	0	0.00%	8	18.18%
19	When I take a walk slowly, I feel calm and stable	21	4	11.76%	11	25.00%
20	I feel calm and stable when I move	7	2	5.88%	4	9.09%

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
ii		100	34	%	44	%
	with aerobics and dance					
21	I feel calm and stable when jumping on a trampoline	11	2	5.88%	8	18.18%
22	I calm down when I tap the desk with a pencil or pen. Don't worry about that	16	2	5.88%	8	18.18%
23	I feel calm and stable when I cut something with a kitchen knife	7	1	2.94%	5	11.36%
24	I calm down when I jump. Don't worry about that	16	3	8.82%	8	18.18%

In "Understanding and support for oral vestibular sensation and proprioception", both groups wanted to cross their legs and stretch. However, With ASD was more likely to need assistance such as jumping from a high place, rocking a chair, standing on one leg or tiptoe, or flying a trampoline. In particular, the percentage of Only Irlen was 0% for "I want you to be calm when I shake in a rocking chair, so don't worry about that", "I calm down when I step on my toes, heels and feet. Don't worry about that", and "I feel calm and stable when jogging". (Table 2)

Table 3. Check rate for "Understanding and support for tactile sensation"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
iii		100	34	%	44	%
1	I calm down when I play with my hair. Don't worry about that	24	4	11.76%	14	31.82%
2	I calm down when I touch my nose and ears with my fingers. Don't worry about that	20	4	11.76%	12	27.27%
3	I calm down when I play with my pocket key or coins by hand. Don't worry about that	9	2	5.88%	5	11.36%
4	I calm down when I entangle my fingers in a knitted mesh of yarn	5	1	2.94%	3	6.82%
5	I calm down when I entangle the chain necklace with my finger	5	1	2.94%	2	4.55%
6	I calm down when I trace a curved object with my finger	11	1	2.94%	9	20.45%
7	I calm when I pack rice and beans in a bag and carry around	2	0	0.00%	2	4.55%
8	I calm down when I pack the flour into a balloon and carry it around	0	0	0.00%	0	0.00%
9	I calm down after taking a warm bath	39	8	23.53%	24	54.55%
10	I calm down when I'm in the water	28	5	14.71%	18	40.91%
11	I want dry shampoo	2	1	2.94%	1	2.27%
12	I feel comfortable being embraced by thick branches on a tree	13	1	2.94%	9	20.45%
13	I calm down when I stroke a dog or cat	41	10	29.41%	24	54.55%
14	I calm down when I stroke my fur	21	2	5.88%	14	31.82%
15	I calm down when I carry a soft toy	24	5	14.71%	15	34.09%
16	I calm down when I knead the clay	16	2	5.88%	12	27.27%
17	I calm down when I play with shaving cream. Don't worry about that	5	3	8.82%	2	4.55%
18	I can get rid of frustration by holding a resilient ball	12	1	2.94%	10	22.73%
19	I feel calm when I hit the table with my finger or pencil, so don't worry about that	9	1	2.94%	3	6.82%
20	I calm down when I rub my skin	20	2	5.88%	13	29.55%
21	I calm down when I play with my nails and cuticles. Don't worry about that	21	3	8.82%	13	29.55%
22	I calm down when I play with	5	0	0.00%	4	9.09%

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
iii		100	34	%	44	%
	earrings and necklaces. Don't worry about that					
23	I calm down when I fiddle with the code on a busy phone. Don't worry about that	12	1	2.94%	9	20.45%
24	I calm down with a pillow	26	7	20.59%	16	36.36%
25	I settle down when I put a cushion or pillow on my lap and feel the weight	19	4	11.76%	11	25.00%
26	I calm down when wrapped in a blanket	47	11	32.35%	27	61.36%
27	I can feel very comfortable in my sleeping bag	20	2	5.88%	16	36.36%
28	I'm relieved to dive under the sofa cushion	13	2	5.88%	8	18.18%
29	I am relieved to dive under the bed	10	2	5.88%	6	13.64%
30	I am relieved of the pressure of hugs	21	2	5.88%	14	31.82%
31	I want to wear tight clothes with rubber on my wrists, feet, waist, etc.	6	0	0.00%	5	11.36%
32	I want you to understand even if I'm dressed so that the seams are on the outside	7	2	5.88%	5	11.36%
33	I want to wash with the same detergent	14	3	8.82%	9	20.45%
34	I'm released from tension by hitting my head	14	3	8.82%	10	22.73%
35	I want you to have enough space when lining up	23	5	14.71%	15	34.09%
36	I want you to call before you touch my body	32	9	26.47%	19	43.18%

In "Understanding and support for tactile sensation", both groups said they were comfortable resting in a warm bath, in the water, or wrapped in a blanket. In addition, both groups answered that rubbing the animals was comfortable, it was considered that animal therapy would be effective. However, in "I calm down when I stroke my fur", the check rate of Only Irlen was 5.88%, With ASD was 31.82%, and it is thought that With ASD people may be purely enjoying tactile sensation. More than 30% of With ASD answered "I can feel very comfortable in my sleeping bag" and "I am relieved of the pressure of hugs", indicating that there is a need for assistance different from Only Irlen . (Table 3)

Table 4. Check rate for "Understanding and support for vision"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
iv		100	34	%	44	%
1	I calm down a room with closed curtains	49	16	47.06%	25	56.82%
2	I calm the dark room	66	27	79.41%	29	65.91%
3	I calm the bright room	5	0	0.00%	3	6.82%
4	Don't worry about turning on and off the lights in the room many times	7	1	2.94%	5	11.36%
5	I want to try light bulbs of various colors and wattage	27	5	14.71%	17	38.64%
6	I calm down with sunglasses. Don't worry about that	36	13	38.24%	19	43.18%
7	I calm down with a hat or visor	15	6	17.65%	7	15.91%
8	I calm down with both hands open. Don't worry about that	11	3	8.82%	6	13.64%
9	I want you to arrange my surroundings in my favorite color	32	9	26.47%	18	40.91%
10	I calm down looking at the aquarium. I want to look forever	18	4	11.76%	12	27.27%
11	I calm down at sunrise and sunset.	19	2	5.88%	14	31.82%

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
iv		100	34	%	44	%
	I want to look forever					
12	I calm down looking at the stained glass. I want to look forever	9	1	2.94%	7	15.91%
13	I calm down when I look at the glitter. I want to look forever	14	1	2.94%	11	25.00%
14	I calm down when I look at the phone book and the map. I want to keep watching	8	1	2.94%	5	11.36%
15	I calm down when I look at encyclopedias and picture books. I want to keep watching	11	2	5.88%	9	20.45%
16	I calm down when I look at the train map. I want to keep watching	7	1	2.94%	6	13.64%
17	I calm down when I arrange the toys beautifully	17	1	2.94%	13	29.55%
18	I calm down when I arrange books in order	27	8	23.53%	16	36.36%
19	I feel very stable when I keep things organized	27	9	26.47%	13	29.55%
20	I calm down when I pair or group everything	12	2	5.88%	9	20.45%
21	I am very calm when I read a book	29	5	14.71%	19	43.18%
22	I want someone to read a book rather than reading it myself	24	4	11.76%	17	38.64%
23	I want a detailed map when I go out alone	36	6	17.65%	22	50.00%
24	I feel comfortable and very calm when looking at straight lines and right angles	11	3	8.82%	7	15.91%

In "Understanding and support for Vision", both groups said they wanted a comfortable room with closed curtains, tried light bulbs of different colors and brightness, and don't mind wearing sunglasses. In particular, 79.41% of Only Irlen say dark rooms are comfortable. Similarly, 65.91% of With ASD said that dark rooms are more comfortable, but some prefer lighter rooms. That was 0% in Only Irlen. Also, With ASD wanted to see the sunrise and sunset, stained glass and glitter.

Table 5. Check rate for "Understanding and support for hearing"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
V		100	34	%	44	%
1	Allow earplugs and headphones	44	8	23.53%	27	61.36%
2	Don't worry about raising or lowering the TV volume	28	3	8.82%	17	38.64%
3	Don't worry if I talk with my hands covering my ears	24	3	8.82%	16	36.36%
4	I feel relaxed when I listen to classical music	34	9	26.47%	21	47.73%
5	I feel relaxed when I hear hard rock	9	0	0.00%	9	20.45%
6	I want to forgive me when I listen to music at the maximum volume and settle down	7	1	2.94%	6	13.64%
7	I calm down when I say myself or hum. Don't worry about that	32	4	11.76%	20	45.45%
8	I calm down when I process or work on my voice. Don't worry about that	8	1	2.94%	5	11.36%
9	I calm down when I repeat counting to ten. Don't worry about that	4	1	2.94%	1	2.27%
10	I'm calm and relieved to listen to other people's humming	3	0	0.00%	2	4.55%
11	At the time of the test, I want the desk to be separated around the desk	30	9	26.47%	15	34.09%
12	I want to work in a lively room	14	1	2.94%	11	25.00%

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
V		100	34	%	44	%
13	Don't put inflection when speaking	24	4	11.76%	16	36.36%
14	I want you to speak at a constant speed	33	6	17.65%	19	43.18%
15	Don't put metaphors or jokes in the middle of a conversation	29	5	14.71%	20	45.45%
16	Don't be angry if I listen again	56	12	35.29%	30	68.18%
17	Let me use tableware that doesn't make much sound	19	3	8.82%	11	25.00%
18	I want you to use chopsticks because the sound of the spoon is harsh	5	0	0.00%	2	4.55%
19	I want to use wooden spoons and forks	14	2	5.88%	8	18.18%
20	Wrap a cloth or the like around the chair legs so that the floor does not rub.	18	3	8.82%	12	27.27%

In "Understanding and support for hearing", both groups responded that they wanted to use earphones or earmuffs, indicating a sense of hearing hypersensitivity. However, With ASD check rate was about three times higher than Only Irlen in terms of up or down the volume of music and covering their ears with their hands when speaking. In addition, both groups said that listening to the classics would be comfortable, but with regard to hard rock, 20.45% of With ASD said they would feel safe, while none of the Only Irlen said. And still, With ASD was different from Only Irlen in that they wanted to work in a lively room, but they disliked the sounds of stacking dishes and rubbing. Both groups wanted to talk without inflection, to talk at a constant speed, and to avoid jokes. Regarding "At the time of the test, I want the desk to be separated around the desk", Only Irlen was 26.47% and With ASD was 34.09%, indicating the need for support.

Table 6. Check rate for "Understanding and support for olfaction"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
vi		100	34	%	44	%
1	I want to carry my favorite perfume	11	1	2.94%	9	20.45%
2	Don't mind me nose plug	0	0	0.00%	0	0.00%
3	I want to choose a household detergent that is unscented	22	4	11.76%	13	29.55%
4	I want to choose unscented soap, rinse and shampoo	22	6	17.65%	13	29.55%
5	I want people around me to stop using perfume and aftershave lotion	35	11	32.35%	19	43.18%
6	I want people around me not to eat strong-smelling food	15	4	11.76%	9	20.45%
7	I want to smell everything I see. Don't worry about that	7	0	0.00%	3	6.82%

In "Understanding and support for olfaction", both groups tended to be sensitive to softener and soap scents, perfumes and aftershave lotions, and strongly scented foods. However, in the case of "I want to carry my favorite perfume", Only Irlen was 2.94% and With ASD was 20.45%, indicating that With ASD may have a particular interest in their favorite fragrance. And, a few With ASD said they wanted to smell anything, but not Only Irlen.

Table 7. Check rate for "Understanding and support for eating"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
vii		100	34	%	44	%
1	I want to heat food to my favorite temperature	25	7	20.59%	14	31.82%
2	I want you to eat less for the first time	26	6	17.65%	12	27.27%
3	When I eat it for the first time, I	9	2	5.88%	6	13.64%

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
vii		100	34	%	44	%
	want you to chop it finely					
4	Puree soup is easier to eat	3	2	5.88%	1	2.27%
5	I want to use supplements	13	2	5.88%	8	18.18%
6	I want to bring my own food	12	0	0.00%	10	22.73%
7	Don't hurry to eat fast	41	9	26.47%	22	50.00%
8	I want to find my favorite toothpaste	17	0	0.00%	7	15.91%

In "Understanding and support for eating", both groups wanted to heat their food to the desired temperature, eat less for the first time, and do not rush to eat. However, With ASD wanted 22.73% for "I want to bring my own food" and 15.91% for "I want to find my favorite toothpaste", while Only Irlen was 0%. In addition, With ASD also wanted to use the supplement.

Table 8. Check rate for "Other"

No	Item	Sum	Only Irlen		With ASD (ADHD, LD)	
viii		100	34	%	44	%
1	Please allow me to get inside the closet	12	1	2.94%	8	18.18%
2	Don't worry about repeating the same thing over and over again	39	5	14.71%	24	54.55%
3	Don't mind spending hours in front of the mirror	6	0	0.00%	4	9.09%
4	Learning using a personal computer is easy to understand	25	3	8.82%	18	40.91%
5	I feel calm and stable when I break the paper	16	0	0.00%	11	25.00%
6	I calm down when there is "my own space" in the house	64	22	64.71%	27	61.36%
7	I feel calm and secure when there is a "personal space" at work	27	7	20.59%	15	34.09%
8	I feel calm and secure when there is a "personal space" in school	37	9	26.47%	19	43.18%
9	I can rest assured that the classroom seats are always the same	35	6	17.65%	18	40.91%
10	I can rest assured by writing down everything	34	5	14.71%	25	56.82%
11	Let me write it down on my computer while talking	15	3	8.82%	12	27.27%
12	Let me film and record classes and lectures	27	8	23.53%	15	34.09%

In "Other", both groups wanted their own space at school and at work. In particular, Only Irlen wanted their own space at home. On the other hand, 18.18% of With ASD answered that "the inside of the closet was calm", but Only Irlen's check rate was 2.94%. Similarly, 5% of With ASD said they would calm if they broke the paper, while Only Irlen was 0%. In addition, both groups answered that they would like to record lessons and lectures, but With ASD said that learning using a computer was easier to understand and take notes.

CONCLUSION

From this study, it was found that even those with Irlen syndrome require different support if they coexist with ASD or not. In addition, it was found that there was a need to consider not only visual support but also sensitivity to other sensations. It is thought that flexible responses at schools and educational sites are necessary.

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