

Asahi**KASEI**

IMMUSORBA™ **TR-350(L)**

Immunoabsorption Column



***Treatment for Immune
neurological diseases***

ASAHI KASEI MEDICAL CO., LTD.
A Pioneer in Blood Purification

Selective immunoadsorption for neurological diseases with easy to handle single use column

Indication

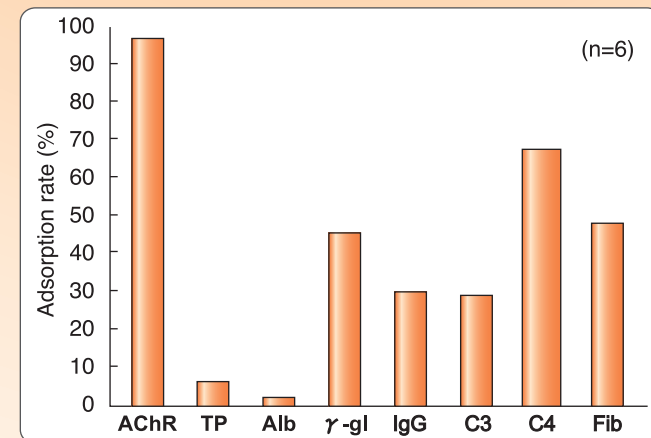
Neurological diseases

(e.g., Myasthenia gravis (MG), Guillain-Barré syndrome (GBS), Chronic inflammatory demyelinating polyneuropathy (CIDP), Multiple sclerosis (MS))

Features of IMMUSORBA TR-350(L)

- Therapeutic plasmapheresis by removing pathogenic substances (anti-acetylcholine receptor antibodies and immune complexes) from patient's plasma by selective adsorption.
- No need for the replacement of plasma, minimizing the risk of infection with hepatitis, AIDS, etc.
- Applicable to patients with protein allergy.

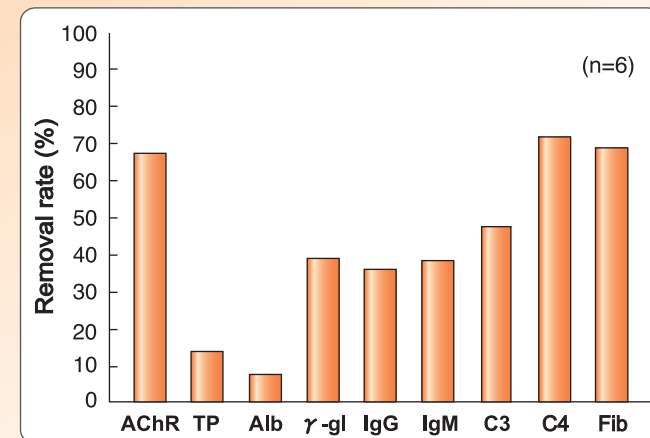
IMMUSORBA TR-350 selectively adsorbed anti-AChR antibodies (*in vivo*)



Plasma samples were collected at the inlet and outlet of the column when 1L plasma was treated.

Shibuya et al. [Article in Japanese] Chiryo 66:49-55, 1984

Removal rate of plasma components from patient (*in vivo*)

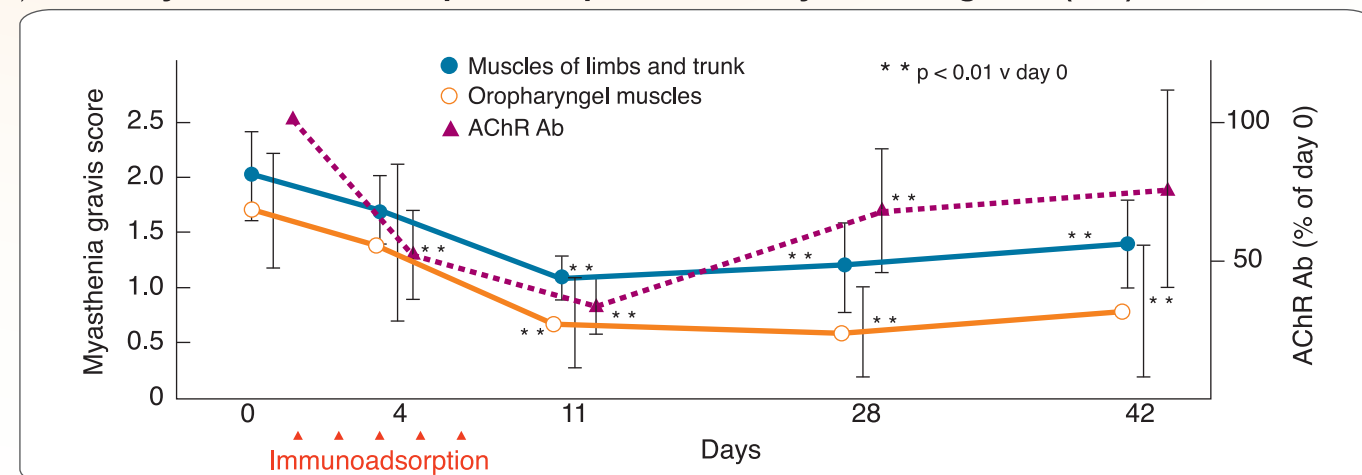


Blood samples for removal rate were collected before and after treatment. Treated plasma volume: 2L

Shibuya et al. Current Practice in Therapeutic Plasmapheresis 166-172, 1985

Clinical Course

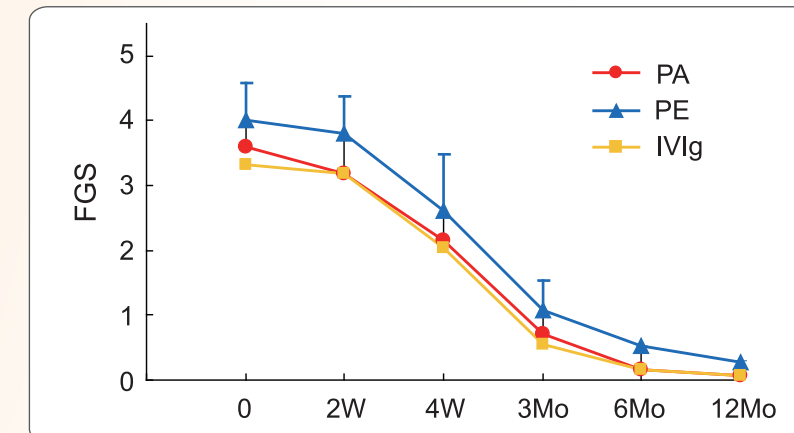
Efficiency of immunoadsorption for patient with Myasthenia gravis (MG)



Mean values of myasthenia gravis score and titer of AChR antibodies in the 11 improved patients after immunoadsorption therapy. Consecutive immunoadsorption treatments induced a significant fall of the myasthenia gravis score and a decrease in the titer of AChR antibodies. The myasthenia gravis score remained low even on day 42 despite the rise in AChR antibody titers.

Shibuya et al. J Neurol Neurosurg Psychiatry 57:578-581, 1994

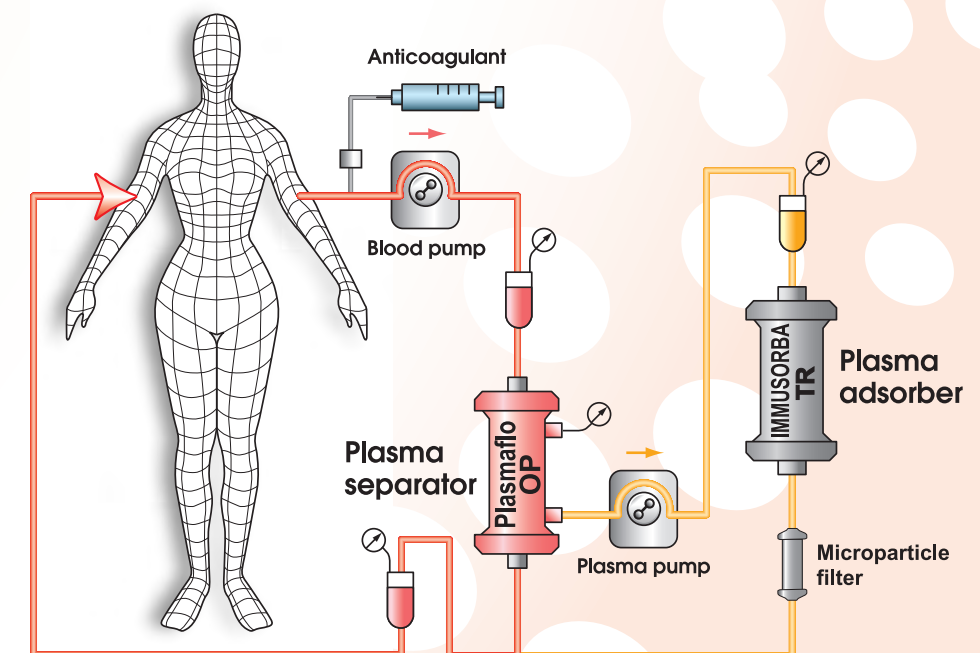
Progressive changes of the functional grading scale (FGS) in PA, PE, and IVIg treatment groups



Seta et al. Clin Neurol Neurosurg. 107:491-6, 2005.

Sixty-three Guillain-Barré Syndrome (GBS) patients were enrolled. These patients were treated with plasma adsorption (PA, n=39: IMMUSORBA TR-350), plasma exchange (PE, n=14), or immunoglobulin treatment (IVIg, n=10). Treatment methods (PA, PE, or IVIg) did not significantly influence the outcome. Since PA does not result in a risk of unknown infection, choosing a PA may be justified.

Circuit Diagram



Specifications

Immunoadsorption Column	Adsorbent	Material	Tryptophan immobilized polyvinylalcohol gel
		Volume	350mL
	Priming Volume		300mL
	Container	Material	Polypropylene
		Dimension	211mm [L] x 62mm [D]
Microparticle Filter	Weight		650g
	Sterilization		High pressure steam
	Filter	Material	Polyethylene (coated with ethylene-vinylalcohol copolymer)
		Area	0.07m ²
	Container	Material	Poly (vinyl chloride)
		Dimension	165mm [L] x 22mm [D]
Microparticle Filter	Priming Volume		30mL
	Sterilization		Ethylene oxide

Caution

For patients undergoing treatment with angiotensin-converting enzyme (ACE) inhibitor, there is a possibility that treatment with the IMMUSORBA TR-350 will lead to a drop in blood pressure. Simultaneous treatment with ACE inhibitor and the IMMUSORBA TR-350 must be avoided.

The IMMUSORBA TR-350 is intended for the treatment of plasma. Never run whole blood through the IMMUSORBA TR-350. Thrombocytes cannot pass through the IMMUSORBA TR-350 and may cause blockage. Do not use the IMMUSORBA TR-350 with plasma containing a large amount of thrombocytes.

References

【Reviews of the product】

- 1) Hirata et al. Immusorba TR and PH. Ther Apher Dial. 7:85-90, 2003
- 2) Yoshida et al. Immusorba TR and Immusorba PH: basics of design and features of functions. Ther Apher. 4:127-34, 2000

【Reviews in clinical use】

- 1) Yang et al. Plasma adsorption in critical care. Ther Apher. 6:184-8, 2002
- 2) Tagawa et al. Ability to remove immunoglobulins and anti-ganglioside antibodies by plasma exchange, double-filtration plasmapheresis and immunoadsorption. J Neurol Sci. 157:90-95, 1998
- 3) Yamazaki. Extracorporeal immunoadsorption. Therapeutic Plasmapheresis VI 113-121, 1986

【Pre-clinical & Development】

- 1) Yamazaki et al. Extracorporeal immunoadsorption with IM-PH or IM-TR column. Biomater Artif Cells Artif Organs. 17:117-124, 1989

【Application to MG】

- 1) Nagane et al. Early aggressive treatment strategy against myasthenia gravis. Eur Neurol. 65:16-22, 2011.
- 2) Wagner et al. [Long-term treatment of refractory myasthenia gravis with immunoadsorption]. [Article in German]. Dtsch Med Wochenschr. 133:2377-82, 2008.
- 3) Haupt et al. Immunoadsorption in Guillain-Barre syndrome and myasthenia gravis. Ther Apher. 4:195-197, 2000
- 4) Yeh et al. Optimal volume of processed plasma and total number of selective plasmapheresis sessions in the treatment of patients with severe generalized myasthenia gravis. J Clin Apher. 14:177-180, 1999
- 5) Shibuya et al. Immunoadsorption therapy for myasthenia gravis, J Neurol Neurosurg Psychiatry. 57:578-581, 1994
- 6) Sawada et al. Myasthenia gravis therapy: immunoadsorbent may eliminate need for plasma products. Cleve Clin J Med. 60:60-64, 1993
- 7) Avanzi et al. Semiselective Immunoadsorption of anti-AChR abs on Tryptophan column in Myasthenia Gravis. Clinical Experience in 32 patients. Transfus Sci. 14:17-31, 1993
- 8) Sugahara et al. Clinical Evaluation of Immunoabsorbent Therapy and Double Filtration Plasmapheresis in Refractory Myasthenia Gravis. Therapeutic plasmapheresis (X) 111-115, 1991
- 9) Shibuya et al. Immunoadsorption Therapy for Myasthenia Gravis: Multicenter Trial in a Single Blind Design. Therapeutic Plasmapheresis (VIII): 231-233, 1989
- 10) Sato et al. Therapeutic immunoadsorption of acetylcholine receptor antibodies in myasthenia gravis. Ann N Y Acad Sci. 540:554-6, 1988
- 11) Heininger et al. Selective Removal of Antibodies : Theoretical and Practical Aspects. Therapeutic Plasmapheresis (VI) 136-142, 1986
- 12) Shibuya et al. Immunoadsorbent perfusion therapy in patients with myasthenia gravis. Current Practice in Therapeutic Plasmapheresis 166-172, 1985
- 13) Shibuya et al. New treatment using immunoadsorption column. [Article in Japanese] Cyryo. 66:49-55, 1984
- 14) Sato et al. In vivo removal of anti-acetylcholine receptor antibodies with a new immunoadsorbent in sera from myasthenia gravis patients.

【Application to GBS】

- 1) Seta et al. Factors influencing outcome in Guillain-Barré Syndrome: comparison of plasma adsorption against other treatments. Clin Neurol Neurosurg. 107:491-6, 2005.
- 2) Arakawa et al. Immunoadsorption therapy for a child with Guillain-Barre syndrome subsequent to Mycoplasma infection: a case study. Brain Dev. 27:431-3, 2005.
- 3) Okamiya et al. Tryptophan-immobilized column-based immunoadsorption as the choice method for plasmapheresis in Guillain-Barre syndrome. Ther Apher Dial. 8:248-253, 2004
- 4) Diener et al. A preliminary, randomized, multicenter study comparing intravenous immunoglobulin, plasma exchange, and immune adsorption in Guillain-Barre syndrome. Eur Neurol. 46:107-109, 2001

- 5) Haupt et al. Apheresis and selective adsorption plus immunoglobulin treatment in Guillain-Barre syndrome. Ther Apher. 4:198-200, 2000
- 6) Haupt et al. Sequential treatment of Guillain-Barre syndrome with extracorporeal elimination and intravenous immunoglobulin. Ther Apher. 1:55-57, 1997
- 7) Haupt et al. Sequential treatment of Guillain-Barre syndrome with extracorporeal elimination and intravenous immunoglobulin. J Neurol Sci. 137:145-149, 1996
- 8) Yamazaki et al. Comparative study of the efficacy of plasma exchange, immunoadsorption plasmapheresis and corticosteroid administration in the treatment of Guillain-Barre syndrome. Article in Japanese with English Abstract. Arerugi. 44:498-502, 1995
- 9) Haupt et al. Pilot study of a new treatment concept for acute Guillain-Barre syndrome. Transfus Sci. 16:139-144, 1995
- 10) Jimenez et al. Adsorption therapy with tryptophan-conjugated polyvinyl alcohol gels in 10 patients with acute Guillain-Barre syndrome. Transfus Sci. 14:9-11, 1993
- 11) Rosenow et al. Plasma exchange and selective adsorption in Guillain-Barre syndrome --a comparison of therapies by clinical course and side effects. Transfus Sci. 14:13-15, 1993
- 12) Iwahashi et al. Immunoadsorption (TR-350) in Guillain-Barre Syndrome. Therapeutic Apheresis (XII) 551-555, 1993
- 13) Iwahashi et al. Immunoadsorption (TR-350) in Guillain-Barre Syndrome. Therapeutic Apheresis (X) 88-93, 1991

【Application to CIDP】

- 1) Galldiks et al. Immunoadsorption in patients with chronic inflammatory demyelinating polyradiculoneuropathy with unsatisfactory response to first-line treatment. Eur Neurol. 66:183-9, 2011.

【Application to MS/NMO】

- 1) Trebst et al. Immunoadsorption Therapy for Steroid-Unresponsive Relapses in Patients with Multiple Sclerosis. Blood Purif. 33:1-6, 2011.
- 2) Mauch et al. [Immunoadsorption for steroid-unresponsive multiple sclerosis-relapses : Clinical data of 14 patients]. [Article in German]. Nervenarzt. 82:1590-5, 2011.

【Application to other diseases】

- 1) Herrero-González et al. Successful adjuvant treatment of severe bullous pemphigoid by tryptophan immunoadsorption. Clin Exp Dermatol. 30:519-22, 2005.
- 2) Lüftl et al. Successful removal of pathogenic autoantibodies in pemphigus by immunoadsorption with a tryptophan-linked polyvinylalcohol adsorber. Br J Dermatol. 149:598-605, 2003.
- 3) Beige et al. Immunoadsorption with tryptophan adsorbers for successful treatment of late steroid-refractory recurrent focal glomerulosclerosis. Am J Transplant. 3:1459, 2003
- 4) Widder et al. Changes of hemorheological and biochemical parameters after plasma perfusion using a tryptophan-polyvinyl alcohol adsorber leading to clinical improvement in patients suffering from maculopathy. Blood Purif. 16:15-21, 1998
- 5) Griffin et al. Recombinant Human Autoantigens as an Extracorporeal Immunoadsorbent in Therapeutic Apheresis. Jpn J Apheresis 16:17-22, 1997
- 6) Yuki. Tryptophan-immobilized column adsorbs immunoglobulin G anti-GQ1b antibody from Fisher's syndrome: A new approach to treatment. Neurology. 46:1644-1651, 1996
- 7) Yamada et al. In vitro study on the removal of pemphigus antibody with immunoadsorption. J Clin Apher. 11:14-15, 1996
- 8) Koh et al. Immunoadsorption Plasmapheresis in Polymyositis/Dermatomyositis : Beneficial Effects in Four Cases. Jpn J Apheresis 13:131-132, 1994

AsahiKASEI

Manufacturer:

ASAHI KASEI MEDICAL CO., LTD.

1-105 Kanda Jinbocho, Chiyoda-ku, Tokyo 101-8101, Japan
TEL: +81-3-3296-3727 FAX: +81-3-3296-3722
URL: <http://www.asahikasei-medical.com>

Represented in Europe by:

ASAHI KASEI MEDICAL EUROPE GmbH

Herriotstrasse 1, 60528 Frankfurt am Main, Germany
TEL: +49 (0) 69 66 37 15 00 FAX: +49 (0) 69 6 66 51 93

Represented in Americas by:

ASAHI KASEI MEDICAL AMERICA INC.

3570 Winchester Road, Suite 101, Memphis, Tennessee 38118, USA
TEL: +1-901-362-6105 FAX: +1-901-362-6180

CE
0086