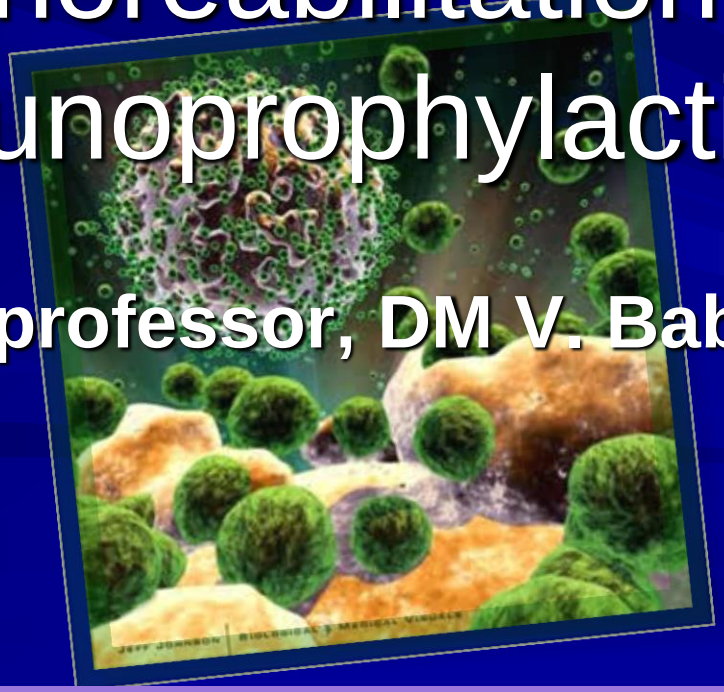
LECTURE 3

Diseases of the immune system. Principles of immunodiagnosis, immunotherapy, immunoreabilitation and immunoprophylactics.



Lecturer: professor, DM V. Babadzhan.

Secondary immunodeficit state is violation of the immune system, developing in a postneonatal period (in adults) and not subsequent upon genetic defects.

Secondary immunodeficit is dysimmunity, which arise up as a result of somatic and other diseases, and also other factors and have clinical symptoms.

Secondary immunodeficit

a) develops on a background before normally functioning immune system;

b) characterized the proof decline of quantitative and functional indexes of immune status;

c) it is the area of risk development of chronic infectious diseases, autoimmune pathology, allergic diseases and tumor formations.

(Dranik G.N., 2005)

Forms of secondary immunodeficits

The squared **secondary immunodeficit is a syndrome of AIDS, developing as a result of defeat of the immune system the virus of immunodeficit (HIV).**

The **inducting (specified) secondary immunodeficit (ICD-10, code D.84.8) arises up as a result of concrete reasons, causing its appearance: x-ray radiation, cytostatic therapy, application of corticosteroids, traumas and surgical intervention, dysimmunities, developing the secondary in relation to a basic disease (diabetes, disease of liver, kinds, malignant tumors).**

The **spontaneous (unspecified) secondary immunodeficit (ICD-10, code D.84.9) is characterized absence of reason, causing violation of immune reactivity. Clinically shows up as chronic, recidivate infectiously-inflammatory processes of bronchial vehicle, additional bosoms of nose, urogenital and gastroenteric highway, eyes, skin, soft tissues, caused opportunistic microorganisms.**

CLASSIFICATION OF SECONDARY IMMUNODEFICITES

- By the rates of development:
- Acute immunodeficit (conditioned an acute infectious disease, trauma, intoxication and other).
- Chronic immunodeficit (develops on a background of chronic festering-inflammatory diseases, autoimmunity, tumors, persistent viral infection).
- II. By the level of breakage:
- Violation of cellular (T-cells) immunity.
- Violation of humeral (B-cells) immunity.
- Violation of phagocytes.
- Violation of complement system.
- Combined defects.
- III. By prevalence:
- «Local» immunodeficit.
- Systemic immunodeficit.
- IV. By the degree of severity:
- Compensated (miled).
- Subcompensated (moderate).
- Decompensated (severe).

Basic principles of treatment of IDES at the repeated viral-bacterial infections

1. Valuable, balanced on squirrel, vitamins and oligoelements (Zn, Se, Cu, Co) diet
2. Hypoallergic diet;
3. Sanacion of chronic infections;
4. W of leadthrough of vaccination during the leadthrough of course of complex therapy;
5. Renewal of microbiocenosis of skin and mucous membranes;
6. Antioxydant therapy;
7. Immunomodulatory therapy;
8. Adequate rational antibacterial, antiviral, antifungal therapy.

Immunotropic preparations

- **Immunostimulators (immunomodulators)**
- **Synthetic (chemical):**
- - Imunofan
- - Cicloferon
- - Groprinozin
- - Polioxydonium
- - Amiksin
- - Cagocel
- **Synthetic (rekombinant):**
- - interferon-alfa
- - IL-2

Immunotropic preparations

- **Immunostimulators (immunomodulators)**
- Biological (human, animal origin):
- - Immunoglobulins
- - Erbisol
- - Thymalin
- - Tactivin

- **Immunosupressive**
- Glucocorticosteroids
- Citostatics
- Monoclonal antibodies
- Ciclosporin A

Immunoprophilactic and immunoreabilitation preparations

- Vegetable
- Bacterial
- Mycotic
- Antiviral vaccines
- Allergovaccintion

Classification of immune drugs at the point of application

Affecting primarily on a cellular link (NK-cells, T-killer cells)	Affecting mainly on humoral (B-lymphocytes, Ig)	Affecting predominantly macrophage-monocytic link	influencing on interferon status
•timalin •Imunofan •immunomaks •Galavit ® (100 mg)	• immunoglobulins •Interferons (reduce the synthesis of immunoglobulins) • Bacterial Immunopreparat (ribomunil, bronhomunal) • Galavit ® (200 mg - reduced the synthesis of low avidity antibody in a dose of 100 mg - improves the specificity of the antibody)	•polioksidony •sodium nucleinate •immunomaks •derinat •Galavit ®	• Interferon preparations: (laferon, viferon, Laferobion, etc.) • Interferon inducers (amiksin, Lavomax, tsikloferon, Kagocel proteflazid) • Galavit ® (100 mg - increases the synthesis of interferon)

Immunostimulators

Clinical criteria: chronic festering infection, low efficiency of treatment of inflammatory process; treatment of cytostatics, glucocorticosteroids, antibacterial and radial therapy.

Immunological criterias: decrease of amount and functional activity of lymphocytes, decline level of immunoglobulines, complement, phagocytic activity (uncompleted phagocytosis) no less what on 30-50%.

Immunosupressive therapy

Clinical criteria: heavy forms of allergy with the defeat of kinds, transplantation of organs and tissues, connecting system diseases.

Immunological criteria: appearance high titles of autoantibodyes in blood.

PRINCIPLES OF POSITIVE IMMUNOTROPIC (IMMUNOMODULATORY) THERAPY OF ID

1.Renewal of T-cells immunity with using of timic factors (taktivin, thymalin, thymogen, imunofan)

2.Renewal of IFN status (viferon, laferon);

3.Renewal of ativity of NK-cells (immunomaks, gepon, lykopid, polioxydonyum);

4.Renewal of gumeral immunity (myelopid).

IMMUNOCORRECTION (I)
(ID, lymphocyte type)

CRITERIA

1. Decline of maintenance of CD3, CD4, CD25.

2. Decline of immunoregulatory index of CD4/CD8.

3. Decline of production IL-2, gamma-INF.

4. Increase of production IL-4, 5, 6.

- **STIMULATION of SYNTHESIS ILT-2 (IZOPRINOZIN, GROPRINOZIN)**
- **THYMIC PEPTIDS:**

- old are THYMALIN, TAKTIVIN, THYMOPTIN

- new are ZADAKSIN, IMMUNOFAN

- **METABOLIC ROW - GALAVIT.**

The patient 37 years old. Diagnosis: chronic recurrent herpes viral infection in the area of the face and lips. Oropharyngeal candidiasis. Immune deficiency in T-

Показник		Результат		Норма			Виражений ані-зоцитоз, анізо-хромія ТЗН=45%	
Гемоглобін		112		Ж – 115 – 145, М – 132 - 164 г/л				
Еритроцити		3,4		Ж - 3,7 – 4 ,7, М – 4,0 – 5,1x10^{12} /л				
Тромбоцити		260		150 – 320x10^{9} /л				
ШОЕ		18		2 – 15 мм /год.				
Лейкоцити		3,8		4 – 9x109 /л				
Нейтр. 43 – 71 % 2000-6500	Пал.\яд. 1 – 4 % 80-400	Сегм. \яд.	Еоз. 0,5 – 5% 80-370	Баз. 0 – 1% 20-80	Мон. 3 – 9% 90-720	Лімф. 25 – 37% 1600-3000	БГЛ 1-5% 80-500	Плаз. 0 – 1% 20-80
67	3	64	4	0	8	21	0	0
2550	110	2440	150		300	800		
Імунологічні показники		Резуль-тат	Норма (Од СІ)	Імунологічні показники			Резуль-тат	Норма (Од СІ)
Т- лімф. CD-3	%	45	50 – 80	Ig G			15,1	8,0-18,0 г\л
	Абс. число	360	1000-2200					
Т- хелп. CD-4	%	27	33-46	Ig M			4,08	0,2-2,0 г\л
	Абс. число	216	309-1571					
Т- супрес. CD-8	%	39	17-30	Ig A			1,62	0,3-3,0 г\л
	Абс. число	312	282-999					
IPI	CD–4/CD–8	0,69	1,4-2,0	ЦІК			62	30 – 50 Од. опт. щільн.
NK-клі-тини CD-16	%	15	12 – 23	Поглинальна активність		ФЧ	93	60 – 80%
	Абс. число	120	72-543			ФІ	4,57	1,5 – 3,5
В-лімф. CD-22	%	28	17-31	НСТ -тест		спон.	11	до 10%
	Абс. число	224	109-532			Інд.	19	-
РБТЛ	спон.	14	до 10%			рез.	8	16%
	інд.	71	50-70%	Комплемент		СН-50	74	30 – 60 гем. Од/мл

Causal and Immunotropic therapy:
1) Zovirax (acyclovir) 400 mg is inside the 4 times a day for 1 month ; Gerpevir (ointment) lubricate the affected skin and mucous membranes of the lips 4 times a day 7 days;
3) viferon 500 thousand IU 1 per day in candlelight for 1 month ; virohel - lubricate the affected skin and mucous membranes of the lips , 2 times a day, 5 - 7 days;
- Interferon inductor - cyclopheron - 12.5 % injection - 2 ml , dose of 0.25 g / m at 1, 2, 4, 6, 8, 11, 14, 17, 20 , 23, 26, 29 days. After interferon ;
4) imunofan 1 ml / m in a day , № 10;
5) Polyoxidonium 12 mg (suppository) 1 every 3 days , № 10;
6) amiksin 125 mg (1 cap.) Day after breakfast , № 20;
7) intrakonazol (intrunhar) 100 mg 1 time a day for 2 weeks .

GROPRINOZIN

GROPRINOZIN is antiviral preparation with direct antiviral and mediated through the immune system effect.

Effects of GROPRINOZIN

- **IL-2 synthesis stimulation;**
- **stimulates activity of NK-cells (even for healthy people);**
- **stimulates phagocyte activity of macrophages;**
- **stimulates macrophagal activity in presentation by them antigens and activation of antibodyproductive cells;**
- **stimulates expression of membrane receptors;**
- **warns the postviral weakening of cellular RNK and albumins synthesis in cells which were infected;**
- **slows the synthesis of viral RNK.**

Groprinozin prescribes 50 mg/kg daily in 3-4 receptions - 8 days (1-2 weeks, in accordance with changes in immunogramme prescribe the repeated courses during more long time - 15-30 days)

THYMALIN

Thymalin stimulates the differentiation of cells of the lymphoid system, changing not only functional activity of lymphocites but also causing the secretion of cytocins, for example IL-2.

Thymalin is a complex of thymus peptids,

10 mg dissolve in 1-2 ml of isotonic solution of sodium chloride.
IM injections 5-20 mgs (30-100 mgs on a course) for adults,
1 mg for of 1 year children;
2-3 mg for 4-6 years;
3,5 mg for 4-14 years during 3-10 days.

IMMUNOFAN

IMMUNOFAN - regulatory thymic synthetic peptide

- **Proceeds in an amount and activity of T-lymphocites, foremost - due to CD4-cells;**
- **Proceeds in balance of cytocins in regard to subpopulation of T-helpers of 1th type, in particular, IL-2, INF-gamma;**
- **Activates the function of natural killers;**
- **Deceleration of apoptosis (↑ bcl-2, ↓ fax, ↓ bax, ↓ bab)**
- **Improve more effective blocking of virus replication.**

IMMUNOFAN 50 mg 1ml prescribes IM ones in 2 days, course of treatment - 10 injections.

GALAVIT

- Mainly influences on the system of macrophages and lymphocytic link;
- Stimulates phagocyte activity in its initial deficit.
- Restores activity of T-cells;
- Regulates the synthesis of proinflammatory cytocins (TNF-b, IL-2, IL-12);
- Normalize phagocytosis;
- Blocks the mechanisms of auto-aggression, including - in CNS.
- Possesses an antioxidant action.
- Stimulates reparation of damaged tissues

GALAVIT prescribes for 100 mg 1 time per day of IM (10 injections), in future - for to a 1 candle per day (10 candles).

The patient 48 years old. Diagnosis: chronic fatigue syndrome. Chronic recurrent herpes virus infection localized in the lips, HSV-1, exacerbation. Immuno-deficiency (D84.9), lymphocytic type, chronic, IN-1, FN II stage.

Показник		Результат		Норма			Виражений ані-зоцитоз, анізо-хромія ТЗН=45%	
Гемоглобін		145		Ж – 115 – 145, М – 132 - 164 г/л				
Еритроцити		4,3		Ж - 3,7 – 4 ,7, М – 4,0 – 5,1x10^{12} /л				
Тромбоцити		200		150 – 320x10^{9} /л				
ШОЕ		12		2 – 15 мм /год.				
Лейкоцити		7,3		4 – 9x109 /л				
Нейтр. 43 – 71 % 2000-6500	Пал.\яд. 1 – 4 % 80-400	Сегм. \яд.	Еоз. 0,5 – 5% 80-370	Баз. 0 – 1% 20-80	Мон. 3 – 9% 90-720	Лімф. 25 – 37% 1600-3000	БГЛ 1-5% 80-500	Плаз. 0 – 1% 20-80
64	1	63	6	0	7	19	2	
4570	70	4600	440		510	1390	150	
Імунологічні показники		Резуль-тат	Норма (Од CI)	Імунологічні показники			Резуль-тат	Норма (Од CI)
Т- лімф. CD-3	%	46	50 – 80	Ig G			18,8	8,0-18,0 г\л
	Абс. число	639	1000-2200					
Т- хелп. CD-4	%	28	33-46	Ig M			2,6	0,2-2,0 г\л
	Абс. число	389	309-1571					
Т- супрес. CD-8	%	29	17-30	Ig A			3,2	0,3-3,0 г\л
	Абс. число	305	282-999					
IPI	CD–4/CD–8	1,27	1,4-2,0	ЦІК			60	30 – 50 Од. опт. щільн.
NK-клі-тини CD-16	%	26	12 – 23	Поглинальна активність		ФЧ	89	60 – 80%
	Абс. число	361	72-543			ФІ	3,7	1,5 – 3,5
В-лімф. CD-22	%	23	17-31	НСТ -тест		спон.	11	до 10%
	Абс. число	319	109-532			Інд.	12	-
РБТЛ	спон.	15	до 10%			рез.	11	h16%
	інд.	60	50-70%	Комплемент		СН-50	70	30 – 60 гем. Од/мл

Causal therapy and Immunotropic
1) specific antiviral therapy (replacement - antiherpetic immunoglobulin type 1 to 1.5 ml / m, a total of 5 injections 2 times a week and anticytomehalovirus immunoglobulin (tsytotekt) at 1.5 ml / m, a total of 5 injections 2 times per week;
2) causal antiviral therapy - 2 acyclovir tab. 3 times daily for 7 days;
3) non-specific antiviral therapy
- Laferon 1 million IU a day / m for 10 days;
- Interferon inductor -cyclopheron - 12.5 % injection - 2 ml , dose of 0.25 g / m at 1, 2, 4, 6, 8, 11, 14, 17, 20 , 23, 26, 29 days. Assign after interferon ;
4) halavit 0.2 g in 5 ml physiological . solution / m in a day , 3 injections.
immunorehabilitation :
5) halavit 0.1 g rectal suppositories in a day , 20 days;
6) Nucleinat sodium 0.1 g , 2 times a day , 40 days;
7) lutsetam 1.2 g , 2 times a day (morning and lunch) for a month.

IMMUNOCORRECION (II)
(ID, interferonone type)

CRITERIA

1. Decline of alfa- and gamma-INF production.
2. Decline of CD4 and CD16 levels .
3. Decline of immunoregulatory index of CD4/CD8.
4. Increase of IL-4, 5, 6 production.

- INTERFERONS (VIFERON, LAFERON);
- INDUCTORS of ENDOGENOUS INTERFERON and NK-CRLLS:
- NEOVIR, CYCLOFERON);
- AMIXIN;
- Antiagregants (CURANTYL);
- NEW (with the protracted effect) - KAGOCEL.

PRINCIPLES of INTERFERONTERAPY
in the syndrome of chronic fatigue and immunodeficits

1. Local and systemic application of viferon (laferon).
2. High or middle doses of viferon (laferon) from the beginning of treatment, since 2-3 millions, rarer - with 4-6 million - during 1,5-2 months, further, -
3. The doses of Viferon go down «step by step» in 1,5-time each 2-3 weeks, rarer, - each month.
4. In the relapse of infection to return to former, more high dose on 2-3 weeks, further, is an attempt of decline of dose.
5. Duration of course treatment of viferon (laferon) - no less than 3,5-4,5 months.
6. If necessary courses repeat in critical periods.

KAGOCEL

- STIMULATOR OF ENDOGENOUS INTERFERON SYNTHESIS
- Stimulates the synthesis of proinflammatory cytocins (g-INF, IL-2);
- Proceeds an amount and activity of T-lymphocytes;
- Activates the function of natural killers;
- Restores balance of T-helpers 1th type.

INFLUENCE OF KAGOCEL ON VIRUSES

Stimulation of „late" interferons formation, the protracted increase of antiviral albumins production (to 6-8 days) even in a non-permanent reception.
Has not only immunotropic but also antiviral activity.
Suitable both for treatment of exacerbation and for the prophylaxis reactivation of viruses from family of gerpes.

Application - 2 tab. 3 times per a day during 5 days, and then - 1 tab. 2 times per a day during subsequent 10 days;

CYCLOFERON

Cycloferon - 12,5% solution for injections 2 ml in amp., tab. for 0,15 g, ointment 5% for 5 ml.

Stimulates production of alfa-, beta-, and gamma-interferons, increases the level of CD4+ -T-lymphocites.

Recommended for patients with herpes, citomegalovirus infection, hepatitis, HIV-infection, multiple sclerosis, ulcer disease of stomach, rheumatoid arthritis.

Application 2 ml IM or IV on 1, 2, 4, 6, 8, 11, 14, 17, 20, 23, 26, 29 day.

Appoint at a flu and respirator infections; ointment - at herpes, virginities, arthritis.

IMMUNOCORRECTION (III)
(ID, humeral type)

CRITERIA

- Diminishing of amount of CD19.
- Decline levels of immunoglobulins classes A, M, G.
- Seronegativ forms of infection (specific IGM-, IGG-, DNA+)

SPECIFIC IMMUNOGLOBULINS:

- antistaphylococcal (3 ml IM, 3 - 5 inj. 1 time per 3 days).
- antiherpetic (1 or 2 types) (amp. for 1,5 ml, use for 4,5 ml IM 1 time per 3 days of 5 inj.);
- anticitomegalovirus;
- IG against the virus of Ebshtain-Barr;
- antichamidial (1,5 ml one time per 3 days IM of 6 inj.),

The patient 58 years old. Diagnosis: chronic obstructive pulmonary disease, II c., Exacerbation. Diffuse fibrosis. Emphysema. LW II c. Immunodeficiency by B-cell type (D

Показник		Результат		Норма			Виражений ані-зоцитоз, анізо-хромія	
Гемоглобін		122		Ж – 115 – 145, М – 132 - 164 г/л				
Еритроцити		3,8		Ж - 3,7 – 4 ,7, М – 4,0 – 5,1x10^{12} /л				
Тромбоцити		220		150 – 320x10^{9} /л			ТЗН=45%	
ШОЕ		11		2 – 15 мм /год.				
Лейкоцити		6,6		4 – 9x109 /л				
Нейтр. 43 – 71 % 2000-6500	Пал.\яд. 1 – 4 % 80-400	Сегм. \яд.	Еоз. 0,5 – 5% 80-370	Баз. 0 – 1% 20-80	Мон. 3 – 9% 90-720	Лімф. 25 – 37% 1600-3000	БГЛ 1-5% 80-500	Плаз. 0 – 1% 20-80
66	3	63	6	1	3	23	0	0
4360	200	4160	400	70	200	1518		
Імунологічні показники		Резуль-тат	Норма (Од СІ)	Імунологічні показники			Резуль-тат	Норма (Од СІ)
Т- лімф. CD-3	%	72	50 – 80	Ig G			11,9	8,0-18,0 г\л
	Абс. число	1092	1000-2200					
Т- хелп. CD-4	%	53	33-46	Ig M			0,18	0,2-2,0 г\л
	Абс. число	804	309-1571					
Т- супрес. CD-8	%	21	17-30	Ig A			4,8	0,3-3,0 г\л
	Абс. число	319	282-999					
IPI	CD–4/CD–8	2,5	1,4-2,0	ЦІК			59	30 – 50 Од. опт. щільн.
NK-клі-тини CD-16	%	23	12 – 23	Поглинальна активність		ФЧ	91	60 – 80%
	Абс. число	349	72-543			ФІ	4,45	1,5 – 3,5
В-лімф. CD-22	%	8	17-31	НСТ -тест		спон.	21	до 10%
	Абс. число	121	109-532			Інд.	26	-
РБТЛ	спон.	10	до 10%			рез.	5	h16%
	інд.	40	50-70%	Комплемент		СН-50	55	30 – 60 гем. Од/мл

Immunotropic therapy:
1) causal antibiotic therapy - levofloxacin 500 mg / in drip-Lynn 1 time a day 7 days dimexyd 5 ml per 200 ml of 0.9% sodium chloride in / drip 1 per day 5 days azithromycin 500 mg 1 time a day, 3 days;
2) Polyoxidonium 6 mg / m 2 twice a week, for 10 days;
3) halavit 100 mg 1 time a day / m, 10 days;
4) laktophiltrum 2 MSA. 2 times a day for 14 days.
5) fluconazole 100 mg a day, 10 days.
immunorehabilitation:
6) IRS-1 19 inhalations once a day, 20 days;
7) timalin 1 ml subcutaneously in a day, 10 days.

INTRAVENOUS IMMUNOGLOBULINS

Intravenous immunoglobulins prescribes in day's dose 400 mg/kg IV dropes 1 ml/kg/h for premature born and 4-5 ml/kg/h for worn children.

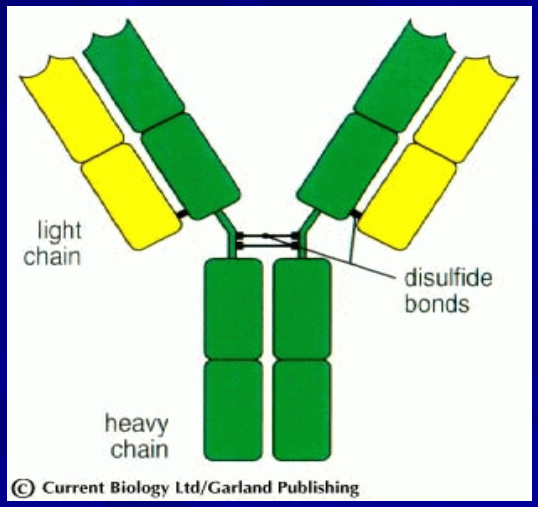
IVG prescribes for prophylaxis of infections to the prematurely born children with mass of body less than 1500 g and by the level of IGG 3 g/l and below.

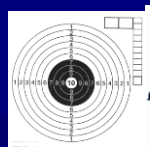
IVG use to achievement the concentration of IGG in blood not below than 4-6 g/l in immunodeficit with the low level of IGG in blood.

IVG prescribes for treatment of heavy festering-inflammatory diseases 1th daily 3-5 injections to reach the dose of IVG 1-2,5 g/kg.

Immunoglobulin therapy

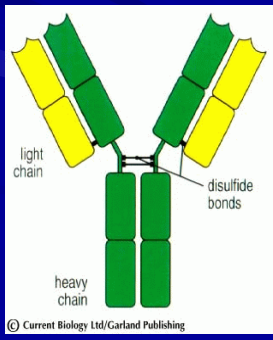
- substitution
  - primary antibody immunodeficiency
  - secondary antibody immunodeficiency
- immunomodulation of autoimmune diseases
- 1 g approx. $4x10^{18}$ IgG molecules
- different dosing





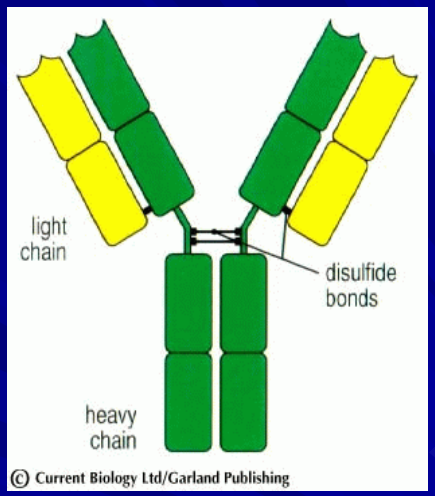
Mechanisms of IVIg effect - Fc fragment dependent

- *blockade of Fc receptors on phagocytes (similar effect as MoAb anti-FcgR, lasts approx. 30 days)*
- *inhibition of proinflammatory cytokines by macrophages (in vitro)*
- *diminishing of NK cells function*
- *effect on Fc receptors on B cells (CD32)*



Mechanisms of IVIg effect - Fab fragment dependent

- *different antigen neutralization*
- *anti-idiotype activity*
- *inhibition of B cell differentiation and activation*
- *creation of rheumatoid factors (anti-Ig Ab)*



Clinical use of IVIg

effect **proven** by RCT

- immune trombocytopenia
- Guillain-Barré syndrome
- chronic demyelinizating neuropathy
- Kawasaki disease
- Dermatomyositis
- Lambert-Eaton myastenic syndrome
- Multifocal neuropathy

effect **not proven** by RCT

- viral induced malaise
- rheumatoid arthritis
- juvenile rheumatoid arthritis

IMMUNOCORRECION (IV)
(ID, phagocytic type)

CRITERIA

- Decline of phagocyte number and index.
- Decline of NBT-test.

- POLIOXSYDONIY - 6 mg of preparation before injection dissolve in 1-1,5 ml of phys. sol., dist. water or 0,25% sol. of Novocain, IM or SC injection.
- Acute inflammatory process: 6 mg daily, course is 3-5 injections;
- Chronic inflammatory process 6 mg daily, 5 injections, then 2 times per a week, course 10-15 injections.

- METHYLURACIL - prescribes in pills for 0,5 g 3 times per a day during 3-4 weeks or by more protracted courses.

The patient 28 years old. Diagnosis: chronic recurrent furunculosis. By phagocytic immunodeficiency type (D 84.9)

Показник		Результат		Норма			Виражений ані-зоцитоз, анізо-хромія	
Гемоглобін		117		Ж – 115 – 145, М – 132 - 164 г/л			ТЗН=45%	
Еритроцити		3,7		Ж - 3,7 – 4 ,7, М – 4,0 – 5,1x10^{12} /л				
Тромбоцити		230		150 – 320x10^{9} /л				
ШОЕ		14		2 – 15 мм /год.				
Лейкоцити		6,1		4 – 9x109 /л				
Нейтр. 43 – 71 % 2000-6500	Пал.\яд. 1 – 4 % 80-400	Сегм. \яд.	Еоз. 0,5 – 5% 80-370	Баз. 0 – 1% 20-80	Мон. 3 – 9% 90-720	Лімф. 25 – 37% 1600-3000	БГЛ 1-5% 80-500	Плаз. 0 – 1% 20-80
59	6	53	2	1	7	31	0	0
3600	370	3230	120	60	430	1890		
Імунологічні показники		Резуль-тат	Норма (Од СІ)	Імунологічні показники			Резуль-тат	Норма (Од СІ)
Т- лімф. CD-3	%	37	50 – 80	Ig G			12,6	8,0-18,0 г\л
	Абс. число	699	1000-2200					
Т- хелп. CD-4	%	17	33-46	Ig M			3,06	0,2-2,0 г\л
	Абс. число	321	309-1571					
Т- супрес. CD-8	%	18	17-30	Ig A			1,8	0,3-3,0 г\л
	Абс. число	340	282-999					
IPI	CD–4/CD–8	0,94	1,4-2,0	ЦІК			76	30 – 50 Од. опт. щільн.
NK-клі-тини CD-16	%	19	12 – 23	Поглинальна активність		ФЧ	42	60 – 80%
	Абс. число	359	72-543			ФІ	1,2	1,5 – 3,5
В-лімф. CD-22	%	23	17-31	НСТ -тест		спон.	4	до 10%
	Абс. число	435	109-532			Інд.	8	-
РБТЛ	спон.	10	до 10%			рез.	4	ь16%
	інд.	60	50-70%	Комплемент		СН-50	75	30 – 60 гем. Од/мл

Immunotropic therapy:
1) specific antibiotic therapy (normal human immunoglobulin 4.5 ml / m in a day for 10 days);
2) causal antibiotic therapy - spiramycin 500 mg 2 times a day;
3) locally - triderm lesions in areas 2 times a day - 2 weeks;
4) Polyoxidonium 6 mg / m 2 twice a week, 20 days or 100 mg halavit a day / m, 20 days;
5) probiotic Linex 2 MSA. 3 times a day, 20 days.
immunorehabilitation:
6) viferon 150 thousand IU, a day in the candlelight, 10 entries;
7) Sodium Nucleinat 0.1 g 3 times a day 30 days

ETIOTROPIC THERAPY

PREPARATIONS OF ACYCLOVIR:

- **ZOVIRAKS;**
- **ACYCLOVIR, ACIK, GERPEVIR.**
- **VALACYCLOVIR (VALTREKS).**
- **GANCYCLOVIR (CIMEVEN).**

- **1. Necessarily - in the period of exacerbation (CMV IgM+, CMV-DNA+).**
- **2. Desirably - appearance of specific organ defeats in conditions of concentration of CMV-IgG growth in dynamics.**
- **3. As a variant of virus-supressive therapy (support of remission): less doses, more long time.**

ETIOTROPIC THERAPY

- FLUOROCHINOLONS (2d, 4th generations - “unrespirator”: ciprofloxacin or gatifloxacin).
- MACROLIDS (spiramicin, roxitromicin, claritromicin, azitromicin, ghozamicin.

- Necessarily - in all cases of determining infection

(Chl -IgM+, Chl-DNA+, growth concentration of Chl-IgG in dynamics).

TREATMENT
of herpesvirus infection

- Acyclovir - 0,2 g 5 times per day 7 days;
- Groprinozin - 50 mg/kg daily - 8 days (1-2 weeks);
- According changes in immunogramme, repeated courses during more long period - 15-30 days).

Interferono-prophylaxis

Interferon (laferon, interferon human intranasal) 1 - 3 million IUN intranasal or
Inductors of interferon
- Cycloferon (neovir) 12,5 % sol. 2 ml IM 2 times per a week or
- Amixin 1 tab. 0,125 on a chart: 3 tab. at once, after for 1 tab. in a day;
- Amizon 1 tab. 0,25 on a chart: 3 tab. at once, after for 1 tab. in a day.

Immunostimulation by cytokines

- **IFN alpha**
  - malignancy, hepatitis B and C
  - flu-like symptoms, malaise, anorexy, mood changes, bone marrow suppression, hepatotoxicity, cardiotoxicity
- **IFN beta**
  - multiple sclerosis
  - possible effect due to inhibition of expression of HLA-DR on glial cells
- **IFN gamma**
  - lepromatous lepra, leishmaniasis, chronic granulomatosis
- **IL-2**
  - PID, HIV, increases number of CD4+ T cells
- **GM-CSF, G-CSF**
  - production of new granulocytes, monocytes and macrophages

Vaccination against flu

- Autumn (better October)
- Possibly simultaneously with other vaccines (in different places)
- To utillize the exceptionally registered vaccines
- INFLUVAK subunit vaccine
  - antigen composition answers annual recommendations of WHO

- Doses: - children from 6 month to 3 years - 0,25 ml
  - to the children more senior than 3 years - 0,50 ml
  - adults - 1,0ml
- Patients, never before getting an inoculation from flu, must get the second dose of preparation in 4-6 weeks.
- Introduction:
  - intramuscular
  - deeply subcutaneously

- before introduction to warm a vaccine to the room temperature.

URGENT FLU CHEMO-PROPHYLAXIS

- Groprinozin - possesses a direct anti-virus and immunostimulation effect. Accept during a peak of disease with a prophylactic purpose for 0,5 g (1 tab.) 3 times per a day during 7 - 10 days.

Arbidol is an action that. Accept during a peak of disease with a prophylactic purpose for 0,2 g (2 tab. for 0,1 g) 1 time per a day during 10 - 14 days.

ETIOTROPIC FLU THERAPY

- Groprinozin - accept, since the first days of flu after meal, a pill can be ground up, for 1 g (2 tab. for 500 mg, daily dose is 50 mgs/kg of body mass) 3 - 4 times per a day during 5 - 7 days. Treatment is continued 1 - 2 days after disappearance of symptoms. In heavy cases day's dose can be increased in 2 times to 100 mg/kg.
- Arbidol - accept, since the first days of flu for 0,2 g (2 tab. for 0,1 g) 4 times per a day during 3 - 5 days.

Tamiflyu (ozeltamivir) is a tablet inhibitir of neuraminidase of flu virus.

RESPIBRON – treatment and prophylaxis of acute respirator infections.

- **Rapid heterospecific stimulation of local immune defense factors of mucous membrane (activation of phagocytosis, increase of lysocim production, interferon).**
- **Protracted protection from exacerbation (stimulation of secretor IGA production by immuno-competent cells).**

CORRECTION OF SECONDARY IMMUNE INSUFFICIENCY AFTER OPERATIONS

- Likopid 0,125mg IM daily 10 injections by a course
- Imunofan for 1 ml 0,05% solution of IM in a day 10 injections by a course
- Polyoxydonium 6 mg IM daily 10 injections by a course
- Galavit 100 mg IM daily 10 injections by a course

CLINICAL EFFECTS OF IMMUNO-CORRECTION

- Diminishing of disease frequency
- Diminishing of frequency of disease
- Acceleration of reparative processes
- Acceleration of reparativnykh processes
- Rapid normalization of temperature
- Diminishing of the phenomena of organism intoxication
- Purging of wounds from festering-necrotizing masses
- Reduction of terms of treatment in clinic


Thank you