

Rituximab+ Bendamustine+ Ibrutinib	mechlorethamine + monoconal Ab+ BTK Inhibitor	untreated& relapsed/re-refractory NHL	lymphopenia, neutropenia , thrombocytopenia, and rash	48	1/1b	52%	N/A	N/A	72% {MCL ORR 94% (76% CR)}	N/A	2015	[96]
Temsirolimus +Bendamustine +Rituximab (BeRT)	(mTOR) inhibitor+ Alkylating agent+ monoconal Ab	r/r FL or MCL: Patients with 1-3 prior therapies	fatigue, nausea , mucositis, vomiting, Cough, diarrhea, pyrexia ,rash, leukopenia, neutropenia & thrombocytopenia	15	1/2	33.33 %	N/A	N/A	93% & for MCL:33%	19 months 67%	2015	[261]
R-DexaBEAM followed by HDT	Rituximab: monoclonal anti-CD20 antibody	relapsed or refractory B-cell lymphoma	all patients undergoing HDT experienced grade 4 haemato-toxicity	103	2	iNHL :32% aNHL :27%	N/A	N/A	aNHL: 62%, iNHL:78%	aNHL: 0.83Y(44% 7.3Y) iNHL: 3.7Y(72% 8Y)	2015	[262]
Bendamustine, lenalidomide and Rituximab	mechlorethamine+ immunomodulatory agent+ monoconal Ab	relapsed and refractory lymphomas	neutropenia was the most common grade 3 and 4 toxicity	20 14 evaluable	1	25%	10%	N/A	35%	N/A	2015	[263]
Temsirolimus and Bortezomib	(mTOR) inhibitor+ proteasome inhibitor	Relapsed or Refractory B-Cell NHL	no unexpected toxicities from the combination	39	2	7.70%	23%	N/A	31%	4.7 months	2015	[264]
Bortezomib and Alvocidib	reversible 26S proteasome inhibitor and flavonoid alkaloid CDK9 kinase inhibitor	multiple myeloma, indolent lymphoma, Waldenstrom macroglobulin emia, and mantle cell lymphoma	leukopenia, lymphopenia, neutropenia, and thrombocytopenia	44, assessable :39 (5 patients of MCL)	1	NA	NA	N/A	N/A	N/A	2014	[138]
Bortezomib-BEAM and autologous hematopoietic stem cell transplantation	Bortezomib: proteasome inhibitor	relapsed/refractory Diffuse and nodular forms of MCL	were manageable with no observed any treatment-related mortalities	42: 13 patients phase I & 29 patients phase II	I/II	At 1 year after ASCT 84% (P1) /81%(p2)	P1:3% P2:4%	P1:91% at 1Y & 67% at 5Y	P1:87% /P2:89%	p1:83% /P2:83% (at 1 Y) and P1:32% at 5Y	2014	[128]
Alisertib	Selective Aurora A Kinase Inhibitor	Relapsed and Refractory Aggressive B- and T-Cell NHL	grade 3/4 toxicities: neutropenia, leukopenia anemia, thrombocytopenia , stomatitis, febrile neutropenia &	48	2	10%	17%	N/A	27%	20% for 720 days	2014	[265]

			fatigue.									
Obatoclox and bortezomib	BH3 mimetic inhibitor+ proteasome inhibitor	relapsed/refractory MCL	Grade 3/4 events: thrombocytopenia, anemia and fatigue	13	I/II	23%	8%	NA	31%	N/A	2014	[208]
panobinostat + everolimus	histone deacetylase inhibitor+ mTOR inhibitor	Relapsed or Refractory Lymphoma	Grade 3/4 toxicity included thrombocytopenia , neutropenia , anemia , infection , fatigue & dyspnea	30, evaluable: 29	1	10%	23%	N/A	33%	N/A	2013	[197]
Lenalidomide + rituximab	L: immune-modulatory agent, R: anti-CD20 mAb	relapsed or refractory MCL	grade 3-4 haematological toxicities	52 (phase1:14, phase1/2:44)	1/2	phase 2:36%	20%	24.3 months	57%	11.1 months	2012	[266]
Everolimus (RAD001)	mTOR inhibitor	Relapsed or Refractory MCL	criteria grade 3 including anemia thrombocytopenia and neutropenia	36, evaluable 35	2	5.70%	14.28%	N/A	20%	5.5 months	2012	[267]
Bendamustine W/O Rituximab	Alkylating agent(mechlorethamine) W/O monoclonal Ab	heavily pretreated NHL	neutropenia, anemia and thrombocytopenia, were primarily grade 0/1/2 in severity	175	multicenter retrospective study	29%	43%	10 months (70%)	71%	N/A	2012	[268]
Temsirolimus+rituximab	(mTOR) inhibitor +an antiCD20 antibody	relapsed or refractory MCL	Thrombocytopenia, neutropenia, fatigue, leucopenia, pneumonia, lymphopenia, pneumonitis & hypertriglyceridaemia	71 enrolled 69 assessable	2	19%	41%	N/A	59%	N/A	2011	[269]
Bendamustine+ Bortezomib+ rituximab	Bendamustine:Alkylating agent, Bortezomib: antineoplastic agent& Rituximab: anti-CD20 antibody	relapsed/refractory indolent and MCL NHL	nausea, neuropathy, fatigue, constipation and fever	30 evaluable: 29	2	51.70%	N/A	N/A	83%	N/A	2010	[126]
RT-PEPC	rituximab: monoclonal anti-CD20 antibody + thalidomide: immune-modulatory agent plus prednisone: antiinflammatory; etoposide+procarbazine (both antineoplastic agents), and cyclophosphamide:	Recurrent MCL	grade 1/ 2 fatigue, rash, neuropathy, and cytopenias, thrombocytopenia and grade 3 and 4 neutropenia	25 enrolled, 22 evaluable	2	32%	41%	N/A	73%	10 months	2010	[270]

	alkylating agent											
Tipifamib	Farnesyltransferase	relapsed/refractory MCL	no grade III–IV hematological toxicities	11	2	9%	0%	N/A	9%	3 months	2010	[271]
Yttrium-90-ibritumomab tiuxetan	Radio-immunotherapy	relapsed/refractory MCL	primarily hematologic, Grade 3/4 thrombocytopenia& Grade 3/4 neutropenia	34	2	15.60 %	15.60 %	21 months	31%	6 months	2009	[272]
Gemcitabine, mitoxantrone, and Rituximab	Gemcitabine: Nucleoside Metabolic Inhibitor	relapsed or refractory MCL	grade 3–4 toxicities : neutropenia, leukopenia, thrombocytopenia& anemia	16	2	20%	27%	N/A	47%	N/A	2009	[273]
Bendamustine + Rituximab	Alkylating agent(mechlorethamine) + monoclonal Ab	relapsed indolent B-cell and MCL non-Hodgkin's lymphoma	well tolerated; the primary toxicity was grade 3/4 neutropenia & grade 3/4 thrombocytopenia	66	2	41%	38%	N/A	92%	23 months	2008	[121]
R-HyperCVAD alternating with rituximab plus methotrexate-cytarabine	Chemo-immunotherapy	relapsed or refractory aggressive MCL	neutropenic fever , grade 3 or 4 neutropenia, and grade 3 or 4 thrombocytopenia	29	2	45%	48%	N/A	93%	N/A	2008	[274]
aza-epothilone Ixabepilone (BMS247550)	microtubule stabilization agent	relapsed or refractory indolent NHL & MCL	fatigue, myelosuppression, neuropathy & the most prominent advanced toxicities were leucopenia & lymphopenia	28 22 assessable	2	4.54%	22.70 %	8 months: 4.54 %	27%	N/A	2008	[275]
Bendamustine+ Mitoxantrone+ Rituximab (BMR)	B:Alkylating agent, M: chemotherapy R: monoclonal Ab	stage III/IV relapsed or refractory indolent lymphomas and mantle cell lymphoma (MCL)	grade 3/4 toxicities	57	2	35%	54%	2 years	89%	19 months	2007	[132]
Enzastaurin	protein kinase C beta inhibitor (serine/threonine kinase inhibitor)	relapsed or refractory MCL	grade 3 anemia, diarrhea, dyspnea, vomiting, hypotension, and syncope	60	2	N/A	N/A	22 months	N/A	2 months	2007	[167]
Bortezomib	proteasome inhibitor	relapsed or refractory B-cell non-Hodgkin's	Grade 3/4 toxicities and three deaths.	60 (12of29 assessable MCL	2	A1:20 .5%	A2:2 0.5%	N/A	A1:41 % , A2:19	6 months (A1:42 % ,	2005	[276]

		lymphoma.		(A1) & 4/2 1 assessable other BCL (A2) )						%	A2:36 (%)		
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Supplementary Table 2: Table describing the details of the published clinical trials on the MCL drugs as single or in combination where A: arm , P: phase, Y: year, R-DexaBEAM: rituximab,examethasone, carmustine, etoposide, cytarabine and melphalan; HDT: high-dose therapy; aNHL: aggressive NHL; iNHL: indolent Lymphoma; N/A : Not available.